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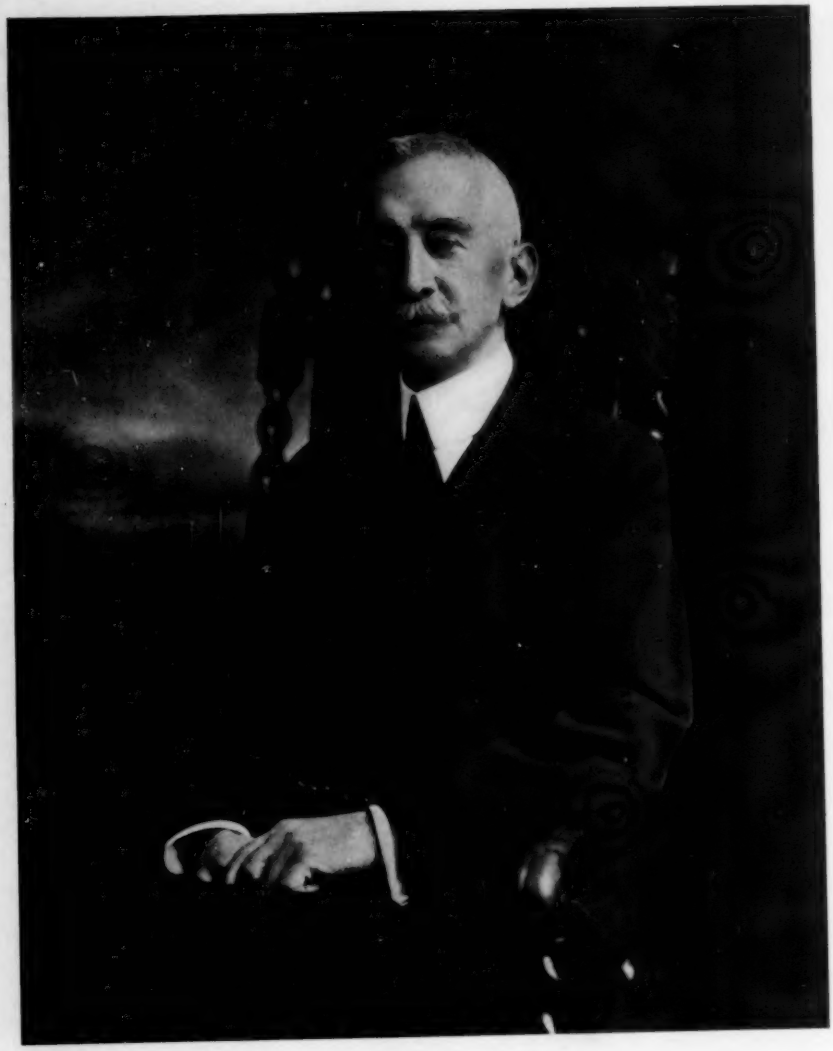

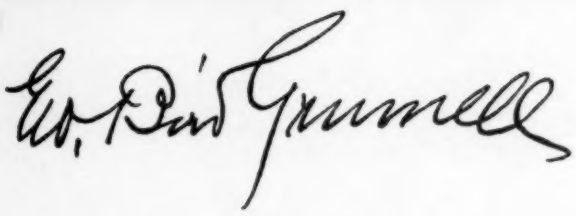

UNIV. OF MICH.

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A QUARTERLY JOURNAL OF

ORNITHOLOGY

VOL. 56 JANUARY, 1939 No. 1

IN MEMORIAM: GEORGE BIRD GRINNELL

Born September 20, 1849—Died April 11, 1938

BY ALBERT KENRICK FISHER

Plates 1, 2

IT seems to be a recognized fact that ornithology in America has advanced further in intricate detail than in any other country, and such accomplishment should make us feel justly proud. We in these modern times, however, cannot but recognize that our efforts have had little to do in building up the background of our science. Those of us who worship the great out-of-doors should not be unjustly criticized if we are inclined to be envious of the experiences of the early naturalists who pushed into the almost unknown wilderness and reaped a wonderful harvest. In such ventures, with minds keyed up with enthusiasm, these men naturally gave little thought to hardship, suffering, or even risk of life, for anticipation of success and opportunity of unfolding Nature's secrets made them think lightly of the unpleasant details sure to creep in from time to time, or even forget them. If we pass by the early ornithological pioneers and consider for a moment the activities of those attached to the Pacific Railroad Surveys, or stationed at frontier army posts, it is easy to imagine their daily enthusiasm as being somewhat comparable to ours when we enter a new region where unfamiliar forms abound. Later on, before Nature was unbalanced by the ignorance, wantonness, or stupidity of man, and untrammeled by mechanical adaptation, those attached to parties that went out under Clarence King, Hayden, General Custer, Colonel Ludlow, and others, also helped in molding the background. Among these was George Bird Grinnell, the subject of this paper, who passed beyond on April 11, 1938, in his eighty-ninth year.[1]

Born in Brooklyn, New York, September 20, 1849, he was the son of George Blake and Helen Lansing Grinnell. Among his ancestors were five Colonial governors and Betty Alden, the first white woman born in New

[1] Photograph taken November 2, 1923.

England. On August 21, 1902, he married Elizabeth Kirby Curtis, widow of Emery Leverett Williams, of Boston, who accompanied him on practically all the expeditions of his later life, and who survives him.

From about the beginning of eastern railroad construction and continuing through time, the building and extension of the lines enabled people to leave congested areas with comparative ease and to reach and build homes farther and farther in the country, following closely on the heels of progress. In 1849, the year Grinnell was born, the Hudson River Railroad completed its line between 30th Street, New York City, and the village of Peekskill, a distance of about forty miles. This form of transportation, more comfortable and rapid than stage coaches, opened up the attractive country along the eastern shore of the Hudson River. Not slow to take advantage of this opportunity, people settled northward along the river, my parents among them, going as far north as Sing Sing in 1852. With this wave of migration, Grinnell's parents moved to Audubon Park on the first of January 1857, about six years after the death of Audubon. Grinnell states that he was then a very small boy, about far enough advanced in polite learning to know A from B. At that time Madam Audubon conducted a little school for her grandchildren, which was attended also by some of the neighbors' children, of whom George was one. It was his first attendance at a school. The whole tract of Audubon Park, with the exception of two houses, belonged to Madam Audubon. The family had abundance of land, with much of it quite unsalable. Grinnell had a vivid memory of an occasion when he accompanied his father to see Madam Audubon and conclude the purchase of a piece of land, and of the great relief, satisfaction, and even gratitude, that she expressed to the elder Grinnell for his willingness to make the purchase.

Madam Audubon gave Grinnell his first conscious lesson about birds. One of his early recollections was being called from the breakfast table one morning to look at a large flock of Passenger Pigeons that was feeding in a dogwood tree twenty-five or thirty feet from the house. There were so many of the birds that all could not alight in it, and many kept fluttering about while others fed on the ground, eating berries knocked off by those above. When Grinnell was a little fellow, Madam Audubon identified for him a Red Crossbill, which he had caught in a crab net. Before Grinnell was old enough to own a gun, he killed with a borrowed one a Ground Dove out of a flock, which was a northern record for the species. The painting of the Eagle and the Lamb that hung in Madam Audubon's room was willed by her to Grinnell, as he had admired and talked about it so much. In Grinnell's will he left this painting together with a valuable collection of Audubon manuscripts to the National Association of Audubon Societies.

Later Grinnell attended Churchill's Military School at Sing Sing. As the

lane which led from the school area to the woods and fields of the country beyond bordered my home property, we often saw the boys on their excursions. Since Grinnell was a lover of the out-of-doors, and probably went to the woods often, we undoubtedly met without knowing that later on we should be the closest of friends. He left this school in 1866, and after a trip abroad entered Yale, where he received his A.B. in 1870, Ph.D. in 1880, and Litt.D. in 1921.

Like many of the happenings of years ago, where positive records are lacking, it often is very difficult or even impossible to remember the date when one first met an individual who later became a devoted friend. This is my experience with Grinnell. Grinnell was not located in New York during the years 1875–79 when the Linnaean Society of New York was founded and meetings were held, and when my studies at the College of Physicians and Surgeons were carried to completion. Consequently our meeting was subsequent to that period. Visits are recalled while he was editor of 'Forest and Stream' and when he was host at his Audubon Park home. On one occasion, to get a better view of the interesting Audubon plates, host and guest spread the huge volume on the parlor floor, where they sat and enjoyed them.

In the summer of 1870 soon after graduating from Yale, Grinnell joined the party of O. C. Marsh to collect vertebrate fossils in the hostile Indian country, during a period of six months. The areas visited were fossil beds in Nebraska, Wyoming, Utah and Kansas where a rich collection of Pliocene and Cretaceous material was secured. He continued to make annual trips to the West, and in 1874 shortly after he had gone to the Peabody Museum as assistant in osteology, he was asked by Professor Marsh to take his place as Naturalist in the expedition to the Black Hills, which was being sent out under command of General Custer.

In almost everyone's life there have been occasions when keen disappointment prevailed because what was thought a minor affair, prevented the accomplishment of one seemingly much more important. When time brought in its final analysis, however, it was found that the intervention was a blessing in disguise, as otherwise dire happenings would have been the alternative. As a good example of this intangible guidance of Nature, or in whatever way we wish to designate it, we will cite Grinnell's last experience with General Custer, who had become very much attached to him during the Black Hills trip. As a consequence, Custer extended him an urgent invitation to accompany the 1876 Expedition as Naturalist. The invitation would have been accepted with alacrity, as the experiences of each day would have been teeming with interest, but at the time, Grinnell was assistant in osteology in the Peabody Museum, where there were duties he considered necessary to perform. Accordingly, he felt obliged with deep regret to decline the invitation. If the lure of the West had drawn him away from New Haven

on this occasion, he undoubtedly would have figured in the grand massacre that annihilated Custer's command. This would have been an added grave tragedy, as the Indians would have lost a later staunch defender, and the country one of its finest naturalists, one who was to be uppermost in advancing conservation and kindred subjects relating to Nature and wildlife.

The numerous letters he wrote to Doctor C. Hart Merriam and others are most interesting and contain much of wisdom and philosophy, often in direct reply to letters sent to him containing a recital of some trouble, opinion, or grievance or other outstanding subject. The following quotations from two of these letters would seem well to record: "One always regrets the opportunities for doing good that were missed, but on the other hand we flatter ourselves with the thought that we have tried to do the best, although of course we wish that our efforts had been attended with more success." "Even old people have to suffer these things [changed conditions of life] from time to time; I was pulled up by the roots from Audubon Park and transplanted at East 15th Street. The change would have been misery if I had permitted myself to think about and lament it. I did not think about it, and did not regret."

In a letter in which he was informed of success in the accomplishment of a rather important and intricate problem, he replied: "The conquering of difficulties is one of the chief joys of life." How aptly this short sentence describes his character! All through his active life when difficult problems arose in conservation, wildlife protection, and Indian and other matters in which he had keen interest, he had such a quiet, unassuming but effective way of planning and carrying methods of organization leading to success, that he should be considered a grand past master in the science of noology.

In 1875, as Naturalist, he accompanied the expedition under Colonel William Ludlow that made a reconnaissance of the Yellowstone Park and adjacent territory. His reports on the natural history of the region, especially relating to the birds and mammals, are full of data of value and interest. During this trip, he visited some of the localities in which Merriam, the sixteen-year-old naturalist of the Hayden Survey of 1872, had the good fortune to explore, and to have the same privilege, not enjoyed by those of this generation, of gaining an insight into the background of ornithology. The lists of species Grinnell recorded as observed in the territory traversed by the expedition include forty mammals and 139 birds, in many cases, well annotated. He had also a nominal list of the mammals and birds of the Yellowstone Park, consisting of Merriam's observations in 1872 and his own made four years later. The list of mammals included thirty-three species and that of the birds eighty-one.

His report was well received by zoologists, but what is perhaps its most significant statement is found in the letter to Colonel Ludlow which ac-

companied his report. In it he wrote: "It may not be out of place here to call your attention to the terrible destruction of large game, for the hides alone, which is constantly going on in those portions of Montana and Wyoming through which we passed. Buffalo, elk, mule-deer, and antelope are being slaughtered by thousands each year, without regard to age or sex, and at all seasons . . . Females of all these species are as eagerly pursued in the spring, when just about to bring forth their young, as at any other time.

"It is estimated that during the winter of 1874–'75 not less than 3,000 elk were killed for their hides alone in the valley of the Yellowstone, between the mouth of Trail Creek and the Hot Springs. If this be true, what must have been the number for both the Territories? Buffalo and mule-deer suffer even more severely than the elk, and antelope nearly as much . . . It is certain that, unless in some way the destruction of these animals can be checked, the large game still so abundant in some localities will ere long be exterminated."

This may be regarded as the keynote of his career as a conservationist, and from that time his strength and his influence were always opposed to the wanton destruction of wildlife.

We both were members of the memorable Harriman Alaskan Expedition of 1899 which gave a group of scientific and literary men an opportunity to enjoy the wonders of Alaska, and at the same time to become well acquainted with one another. Three months of this close association, during which the members, usually high authorities on their subjects, conversed freely, produced combined information that almost equaled a college course. This trip more strongly welded the friendship of Grinnell and myself, a friendship that deepened as time went on. In 1881, accompanied by the late Dr. E. S. Dana of Yale, he made a long canoe trip along the coast of British Columbia. A friend who was going to Charleston, South Carolina, in November 1928, received somewhat of a surprise when Grinnell wrote that he wished he was going with him as he never had been so far south. Knowing him and the region, with its abundance of game, it naturally had been assumed that he would have entered the realms of the South in following his favorite sport of bird shooting.

After his return from Yellowstone Park, Grinnell continued his protest against the terrible havoc wrought by unscrupulous hunters, and warned the country that unless the destruction of these animals was checked in some way, the large game still so abundant in some localities would ere long be exterminated. Years of agitation followed before his recommendation brought about legislation making the killing of game in the parks a punishable crime. Through magazines, particularly 'Forest and Stream,' Grinnell had fought tirelessly for the measure, and in March 1894, its passage was assured.

In December 1887, the Boone and Crockett Club, an association of sportsmen who are especially interested in big game and its conservation, was founded by Doctor Grinnell, Theodore Roosevelt (then assemblyman in New York), and others, at a very opportune time to assist in the fight then going on to secure the enactment of laws for the protection of the big game. Grinnell was active in this association, gave long service in its editorial work, and was its president for ten years. The Club now has world-wide recognition for its progressive activities in securing better treatment and care of wildlife, and for this Grinnell should receive considerable credit.

Although Grinnell was profoundly interested in wildlife, especially birds and big-game animals, as conservationist, naturalist, and sportsman, he also was devoted to the Indians and their welfare, and was a sincere student of their manners, customs and traditions. This interest had its beginning in 1870, when he was associated with Pawnee scouts in a hostile Indian country. The majority of the twenty-six large volumes and numerous lesser publications that he wrote are in part or wholly devoted to the Indians. Outstanding among these is his monumental work 'The Cheyenne Indians, their History and Ways of Life.' Grinnell was an authority on the Plains Indians, especially the Blackfeet, Cheyennes, and Pawnees.

If Grinnell had not made early excursions to the rugged mountain regions of northwestern Montana in search of big game, many more Indians would have starved in the "winter of death" (1883–84), the Blackfeet would have failed to have him as Chief (in the early '90's), and Glacier National Park would not exist. He became very much interested in the Blackfeet, and gave them substantial help. When he heard that the Indians were starving through the rascality of the Indian Agent, four hundred dying, he quickly got in touch with Washington and food was hurried from Fort Shaw and Fort Benton which relieved conditions. The Agent who had made false reports was dismissed. Frequently he visited Washington to see President Roosevelt, or the Secretary of the Interior, to help in Indian troubles, and his friend George Kennan assisted him in promoting public sentiment in favor of the Indians.

Grinnell's good deeds and sane counsel endeared him to members of the Blackfeet tribe, and he was beloved by White Calf, the Chief. In January 1903, White Calf and a band of Blackfeet came to Washington, but on the 27th, White Calf was taken sick with pneumonia and died on the 29th. In a letter written on January 31, Grinnell voiced his sorrow for the loss of the noble Chief, and among other things said: "A good many years ago [the early '90's] when in the big lodge in the center of the circle, at the Medicine Lodge in the ceremonial at which all the Chiefs were present, he made me stand up by his side and told me that he now transferred to me the

care of the people, and henceforth I should be the head chief of the tribe. I have tried hard to deserve the confidence he put in me then and later, but I have often failed." Subsequently he made many trips to the agency for council meetings and pow-wows, and to give advice.

In 1895, President Cleveland chose Grinnell as commissioner to deal with the Blackfoot and Belknap Indians, and in 1902, President Roosevelt delegated him to settle troubles among the Indians at Standing Rock Reservation, in North Dakota. In the winter of 1901–02, he became interested in Charles Lummis's idea of organizing a western society, or league, to start a movement to give Indians fair play. He suggested that we should follow Lummis's lead for the present, and let him start and run the thing from the Southwest end.

One of Grinnell's most interesting stories and one that held his hearers' close attention was of his experience on the summer buffalo hunt of the Pawnee Indians in 1872. This was published in his first book, 'Pawnee Hero Stories and Folk Tales,' in 1889. From 1899 to 1913, he wrote seven interesting books for boys, using 'Jack' as the hero. They were: 'Jack the Young Ranchman'; 'Jack among the Indians'; 'Jack in the Rockies'; 'Jack the Young Canoeman'; 'Jack the Young Trapper'; 'Jack the Young Explorer'; and 'Jack the Young Cowboy.' He once remarked that one had had the distinguished honor of being read aloud by G. K. Gilbert and listened to by Dr. C. Hart Merriam. In his writings he sometimes used the *nom de plume* 'Yo.'

His early association with Madam Audubon and the impression of her teachings on his mind may have been the spark that kindled his desire to found the first bird-protective organization, in 1886, which he called 'The Audubon Society.' It is understood that he personally met the expense of its publications. This movement resulted in the formation of the many State Audubon Societies ten years later. With the foundation of the National Association of Audubon Societies in 1905, he became one of its trustees. It progressively grew to an organization of influence and power in securing protection for wildlife. Undoubtedly his wise and sane judgment functioned as a balance wheel to offset the activities of intolerants, who strongly advocated full protection for all game animals. It always has been the strong opinion of the writer that if in this country sportsmanship were abolished, we would soon become an easy prey for any aggressive nation. Sportsmanship with all its activities is a potent factor in developing and producing men of strength, courage, and character, qualities which serve as a safeguard against aggression.

Grinnell is an outstanding example of the true sportsman, and stands out in sharp contrast to the ruthless and mercenary hunters, known as 'game-hogs,' who sixty years ago, when game was abundant, considered it inex-

haustible and consequently slaughtered it to their hearts' content. Early in his career Grinnell with keen foresight saw that such action would eventually mean extermination. In 'Forest and Stream' and elsewhere he continually called attention to the danger, and gradually others, recognizing it, joined with him in an effort to control the abuse. Grinnell had a prophetic vision, and his keen and active mind, coupled with the teaching of experience, seemed to enable him by intuition or other creative vision to recognize future happenings, which if not corrected, would destroy or greatly injure important activities or resources of value to the nation. This formative power enabled him to start to remedy the ills more or less potential, by enlightening others of the danger and thereby securing public sentiment against the evils.

Doctor Grinnell was natural-history editor of 'Forest and Stream' from 1876 to 1880, operating from the Peabody Museum, in New Haven, but in 1880 he moved to New York and became editor-in-chief and president of the publishing company, positions which he held until 1911, when he sold the paper. As he was both naturalist and sportsman, it is no wonder that the journal progressively improved in all its departments. In a comparatively short time the natural-history section attracted the attention of zoologists and became popular with them. He took great pains to insure accuracy and always made careful inquiry to remove any doubt regarding facts. With this care and foresight, the articles published became standard and received the same consideration as those appearing in older scientific journals. The following portion of a letter written to Doctor Merriam on April 11, 1878, from Yale College Museum, shows how early in his editorial career he started to build up the natural-history section:

"Except for the fear of having the articles cut, I do not see why your members should not be willing to publish in Forest and Stream. I certainly would give them a record of their papers containing any new facts, and I really think it has a certain standing, though, of course, as yet it is rather low among naturalists. If you look over the files, you will see the names of Baird, Coues, Gill, Allen, and others among our contributors, and in 'Birds of the Northwest' and 'Fur Bearing Animals,' Coues quotes frequently from our columns. I take a good deal of interest in the paper, outside of the fact that I am paid to write for it, and am anxious to do anything that I can to raise its scientific standard."

The death of Edward Russell Wilbur, part owner of the Forest and Stream Publishing Co., July 30, 1905, added materially to Grinnell's duties.

With the knowledge that cooperation gives strength to a movement, the American Game Protective Association was founded in September 1911. John B. Burnham, who had been the effective head of the New York Game

GEORGE BIRD GRINNELL AND MRS. GRINNELL IN CAMP WITH THE BLACKFEET

THE OLD HOME IN AUDUBON PARK, BUILT ABOUT 1857

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Commission, was made president, and Grinnell was on the advisory board. This association, with its adjunctive branch, the American Game Conference, brought a large number of sportsmen together and became a power in game conservation.

During the fight for the first migratory-bird law, and for the subsequent migratory-bird treaty with Great Britain and the enabling act thereunder for Federal control of migratory birds, Grinnell rendered great assistance, and was on the advisory council. In the winter of 1907, when a petulant congressman, inspired by a jealous member of another bureau, tried to abolish the Biological Survey, Grinnell rendered fine and effective service in telling of its good work and value.

All inhabitants of our country who have any interest in the out-of-doors, should be more than grateful to Grinnell for his long-continued efforts and final success in securing for them the Glacier National Park, which was acquired by an act of Congress that received President Taft's signature on May 12, 1910. This wonderful and picturesque group of mountains, including the continental divide in northwestern Montana, always had been a favorite hunting ground of Indians and had been visited by three or four different tribes to obtain meat and hides. It was in 1885 that Grinnell, hearing that it was a wonderful game country, went there on a hunting trip. So much was he charmed with the region that he made subsequent trips each summer from 1887 for a number of years, devoting his time to hunting, climbing, and exploring, and to the study of the Blackfoot Indians. In 1891, it occurred to him that the region should be set aside as a national park. As Madison Grant expressed it, "The Glacier National Park, born in the brain of George Bird Grinnell, in 1891, after nineteen years of effort on his part, became an established fact."

Grinnell named many mountain peaks, mainly on the eastern slope of the divide, and in 1898 while on the summit of Blackfoot Mountain, he named Mount Cleveland, the highest peak in the northern part of the park, after the former President. He discovered the glacier now known as Grinnell Glacier, which on a later trip was named in his honor by Lieutenant J. H. Beacon of the Army, who also named Grinnell Mountain and Grinnell Lake. J. W. Schultz, who with others was with him when he discovered the glacier, states, "On the day we discovered Grinnell Glacier, Grinnell killed a fine bighorn ram upon it, and we had a great feast that night."

Grinnell, at the request of the Blackfeet, was one of the three commissioners who treated with the tribe in the purchase of their land included in the proposed park area. He held out for a just price against the two others who advocated a much lower amount. Grinnell's noteworthy article, 'The Crown of the Continent,' giving an account of the region, is to be found in the 'Century Magazine' for September 1901.

When the telegram announcing his death reached the Agency, and the old Blackfeet learned of it, they came in numbers to express their sorrow and to say that they all would have died long ago in 'starvation winter,' but for him, 'Pinut-u-ye-is-tsim-o-kan—Fisher Hat.' Grinnell had saved them and had greatly helped them ever since.

He was active in the founding of the New York Zoological Society of which he became one of the trustees. When the Boone and Crockett Club established the New York Zoological Park in 1895, Grinnell among other things, assisted in choosing the site in the Bronx area. In looking over this park and its collections after forty years of progressive development, one feels that the Club has a right to be justly proud of its accomplishments.

Grinnell was very active in the National Park Association, and in 1925, succeeded Herbert Hoover as its president. He was the oldest living member of the Union Club. Other club memberships included the University, Century, Rockaway, Mayflower Descendants, Society of Colonial Wars, Authors, Explorers, Narrows Island, Cosmos, and Washington Biologists' Field Club. He was a trustee of the Hispanic Society of America and of the National Association of Audubon Societies, Fellow of the American Association for the Advancement of Science, American Ethnological Society, American Geographical Society, the American Museum of Natural History, the American Ornithologists' Union, and a member of the American Society of Mammalogists, the New York Academy of Sciences, the Archaeological Institute of America, the New York Genealogical and Biographical Society, and Psi Upsilon fraternity. For a number of years prior to his death, Grinnell was president of the Narrows Island Club in North Carolina.

So far as we can learn, Grinnell had little interest in fishing as a sport, but of course, if necessary, would go through the formalities to insure a good camp supply of attractive food. On the other hand, he was an ardent follower of the complementary sport with rifle and shotgun. The quest of big game at one time, or of waterfowl or upland game birds at another, lured him to a great variety of localities and at times to far-off places. His ability to absorb and place on paper the interesting and valuable things occurring in these experiences makes his books 'American Duck Shooting' and 'American Game Bird Shooting' masterpieces, most interesting and valuable to both veterans and amateurs. The present writer had the pleasure of reading the latter work in manuscript.

In 1909, a few months after Grinnell departed from Audubon Park and took up new quarters in 15th Street, he invited me to stop with him and remarked, "We cannot give you so large a back yard to play in as you had at Audubon Park, but can protect you from the weather." The following April in a contented mood he wrote, "It has been a great pleasure this spring to have seen more of you than we commonly see. This is something that

ought to grow rather than decrease. You as yet are a mere kid, and I have already fallen into the sere and yellow leaf, and my hold on the twig of life is loosening. To me, therefore, it seems much to be able to see old and dear friends, and I trust you will recognize the existence of this feeling, and will give and use this pleasure whenever you can." We were each interested in joining a club of which the other was a member, and consequently were very glad to exchange compliments; thus, through nomination each of the other, he became a member of the Cosmos Club and I of the Boone and Crockett Club.

About 1906, Grinnell bought a piece of property at Milford, Connecticut, containing after several subsequent purchases approximately two hundred acres, of which ninety acres were woodland, swamp, and stream, and the rest more open ground. Like many of us, he liked to be out of the din of the city and to receive rest and recreation in the woods and fields. He and his wife almost always spent their week-ends there, walking about and sometimes shooting Ruffed Grouse and Woodcock in the swales and Quail in the fields, for he always had hunting dogs.

In 1925, when he received the Roosevelt Memorial gold medal for distinguished service, President Coolidge, who presented it, said: "You were with General Custer in the Black Hills and with Colonel Ludlow in the Yellowstone. You lived among the Indians; you became a member of the Blackfoot tribe. Your studies of their language and customs are authoritative. Few have done so much as you, none has done more, to preserve vast areas of picturesque wilderness for the eyes of posterity in the simple majesty in which you and your fellow pioneers first beheld them. In the Yellowstone Park you prevented the exploitation and, therefore, the destruction of the natural beauty. The Glacier National Park is peculiarly your monument. As editor for thirty-five years of a journal devoted to outdoor life, you have done a noteworthy service in bringing to the men and women of a hurried and harried age the relaxation and revitalization which comes from contact with Nature. I am glad to have a part in the public recognition which your self-effacing and effective life has won."

In a letter from Mr. Barrington Moore, who was a member and at one time secretary of the National Parks Association Committee, are some interesting details that show why victory came to Grinnell's efforts which President Coolidge so highly commended. "At the time it looked as if the invasion of the Yellowstone National Park by the projects for damming Yellowstone Lake would be successful, as it had very strong political support. Of course this would have been disastrous, not only for the Yellowstone, but as a precedent for commercializing the resources of all of the other national parks. Dr. Grinnell through his past work in game protection and other conservation activities and with his early background of news-

paper experience, had confidence in public opinion, if it could be educated and induced to act." He came to the defense of the Yellowstone by bringing together in the National Parks Association a committee of about twenty to twenty-five men of organizations interested in various forms of conservation. It was an impressive group. After becoming secretary, Mr. Moore saw a good deal of Dr. Grinnell, as there was a lot going on in which the committee could be helpful, and testified that Grinnell brought to every problem the rich background of his wide knowledge and experience. Moore remarked that the outstanding characteristics which one felt were his kindliness, his infinite patience, and his unshakable faith in the eventual outcome; and that if things were going with discouraging slowness, he would say that it took years to pass the migratory-bird law or so many years to stop hunting in the Yellowstone.

In summing up his character, we might very appropriately quote the last paragraph of Dr. Robert Cushman Murphy's editorial in the 'New York Herald-Tribune' of April 17, 1938: "Aside from Grinnell's prophetic vision, his forthrightness, his scholarship in the fields of zoology and Indian ethnography, and the drive that empowered him to carry so many causes to successful conclusion, his outstanding personal characteristic was that of never-failing dignity, which was doubtless parcel of all the rest. To meet his eye, feel his iron handclasp, or hear his calm and thrifty words—even when he was a man in his ninth decade—was to conclude that here was the noblest Roman of them all."

Washington, D. C.

REVERSE MIGRATION

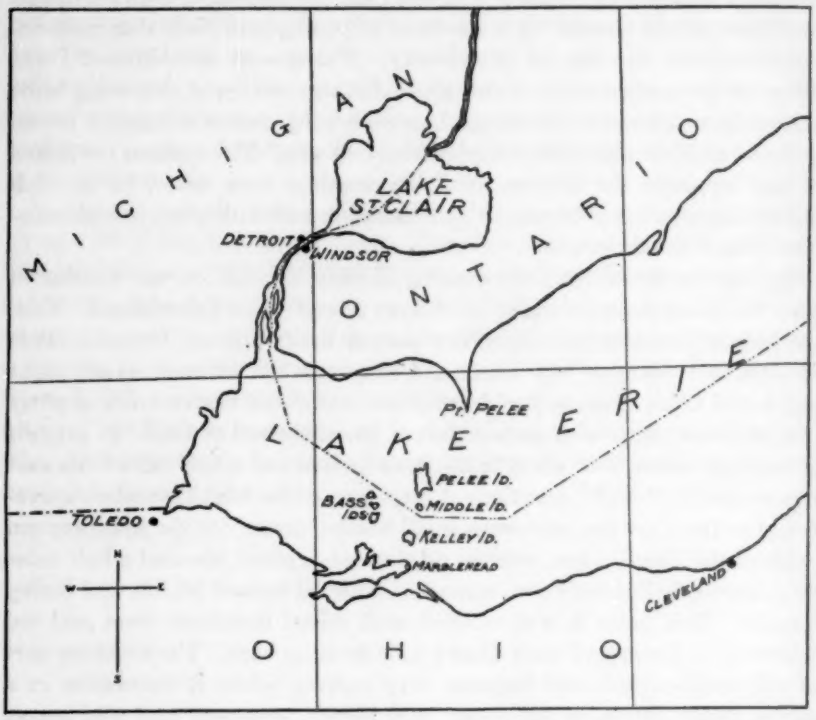
BY HARRISON F. LEWIS

ABOUT thirty-five miles east of the western end of Lake Erie, a series of islands, including Pelee Island, Kelley Island, Middle Island, and the Bass Islands, together with points jutting out from the mainland, both north and south, provides a natural route for those migrating land birds that have occasion to cross the lake in this vicinity. The special suitability of Point Pelee, at the northern end of this route, for observation of migrating birds is already well known. Other stations possessing similar suitability are to be found at other points on this migration highway. These places are points of land opposite the shortest available crossings over water, for at such places migrants occur in greater concentration and with more conspicuousness than is usual elsewhere.

During the period from the evening of May 10, 1937, to the evening of May 14, I had the opportunity to observe migration on Pelee Island. This, the largest island in Lake Erie, is a part of Essex County, Ontario. It is situated in latitude 41° 45′ north and longitude 82° 40′ west, about eight and a half miles southwest of Point Pelee and about twelve miles, slightly east of north, from the nearest part of the mainland of Ohio. It extends about eight miles from north to south and three and a half miles from east to west and is of slight elevation. A large part of the island is under cultivation, but there are also numerous small wooded areas. At the southwestern angle of the island, a low, narrow ridge of sand, about one and a half miles long, known as Fishing Point, extends southward toward Middle and Kelley Islands. This point is well wooded with mixed deciduous trees and red cedars for a distance of more than a mile from its base. The southern part of this tree-covered area becomes very narrow before it terminates in a rather dense growth of red cedar, wild cherry, sycamore and wild grape, beyond which a bare sandy spit projects southward for several hundred yards. A more detailed description of Pelee Island, and of Fishing Point in particular, has been published by Jones (17).

During the four days that I spent on Pelee Island in 1937, I visited Fishing Point daily. On May 11, 12, and 14, I made my visits to it in the early morning; on May 13 I visited it a little before noon. Interesting observations were made on this point every time I went there, but this paper is concerned particularly with observations of migration on May 12, which were very different from those made on my other visits. May 11, 1937, was a fine, sunny spring day on Pelee Island. Barometric pressure declined from 30.31 inches at 7.00 a. m. to 30.17 at 5.45 p. m. The temperature rose from 50° F. at 7.00 a. m., to a maximum of 66° (2.00 p. m. to 3.40 p. m.)

and was 61° at 5.45 p. m. A calm that lasted most of the morning was broken a little before noon by a light southwest wind, which was followed by a brisk southeast wind that blew throughout the afternoon. At 7.00 a. m. on May 12, a fresh wind was blowing from south at the rate of fifteen miles an hour. The sky was partly cloudy and the air was hazy, with 'visibility' for air navigation rated at six miles. The barometer stood at



TEXT-FIG. 1.—Map of western part of Lake Erie and adjacent region.

29.97, the thermometer at 57°. Similar conditions characterized most of the day. The barometric pressure, by 10.50 a. m., had reached a minimum of 29.92, from which there was no significant rise until late in the afternoon. Temperature reached a maximum of 61° at mid-day and was down to 57° at 5.45 p. m. The wind veered to southwest in the latter part of the morning and blew freshly until after four o'clock, when it lessened rapidly. The maximum rate recorded was twenty-five miles an hour at 12.45 p. m. There were light showers near noon and also between four and five o'clock.

At 6.45 a. m., when I arrived at the last trees on Fishing Point, I noticed in the tree-tops a number of Red-headed Woodpeckers and Baltimore

Orioles, with two Orchard Orioles, and supposed that they were recent arrivals from the south, pausing there to rest. In a few moments, however, I was forced to realize, to my astonishment, that the direction of bird flight at that time and place was from north to south, instead of toward the north, and that many birds were participating, singly or in flocks, in this movement. There was an almost continuous stream of warblers and other small birds coming along the point from somewhere north of me and flitting unsteadily out over the rough water toward Middle Island, dimly visible to the southward. At frequent intervals flocks of Cedar Waxwings, Goldfinches, Pine Siskins, and birds that I now believe to have been Pipits swept along the same route. Most of these did not pause in the last trees, but the waxwings often settled there for a minute or less before flying out over the lake. Orioles and Red-headed Woodpeckers made a common practice, I found, of staying in the last trees for several minutes before continuing their southward flight. Those that I saw in the trees when I arrived at the end of the woods were merely the southbound individuals that happened to be resting there at the moment. Baltimore Orioles kept coming from the north, one at a time, so frequently that there were almost always some of them pausing in the last trees.

Most of the birds, once they had left the shelter of the trees, had difficulty in making headway against the wind, but they generally persisted in flying south, rising higher and higher over the lake as they went. Only the Barn Swallows maintained, as they flew, a low elevation, within a foot or two of the wave crests. Despite the adverse conditions, very few birds were seen to turn back, but one flock of Cedar Waxwings, a few groups of Starlings, and a few individual Red-headed Woodpeckers were observed to do so. It seemed as though the bird population of Pelee Island, if not also of regions farther north, were draining away and as if the birds were possessed with an irresistible madness that, in spite of all obstacles and dangers, was driving them southward in the very flowering of the spring. For some time I found it difficult to identify specifically many of the warblers in the stream of them that was flitting past me, but after a while I discovered that, by going north about fifty yards from the last trees, to a place where the line of trees (red cedars and cherry trees) was still narrow, I could observe and identify the warblers well, for on that part of the point they were not making continuous flight, but were travelling southward by flying from tree to tree, feeding as they went.

The southward movement of birds continued undiminished during the two hours, from 6.45 a. m. to 8.45 a. m., that I spent on the outer part of Fishing Point on May 12 and was proceeding without abatement when I departed. When I had left the point entirely and was walking north along the western side of Pelee Island, toward the West Dock, I was passed at

intervals, up to 11.00 a. m., by flocks of Cedar Waxwings and Goldfinches, flying steadily south at low elevation. No birds migrating southward were noticed on the afternoon of May 12, when I was observing birds along the west side of Pelee Island north of West Dock.

There follows an annotated list of the thirty-five species of birds that were seen to take part, near the last trees on Fishing Point, in the southward flight that occurred on the morning of May 12, 1937.

EASTERN MOURNING DOVE, *Zenaidura macroura carolinensis*.—One group of three.

CHIMNEY SWIFT, *Chaetura pelagica*.—One or two.

RED-HEADED WOODPECKER, *Melanerpes erythrocephalus*.—Four or five were in the last trees when I arrived near them, at 6.45 a. m. These remained there for a while and additional individuals straggled in from the north and joined the group until 7.30 a. m., when nine or ten birds of this species were present. Then they all flew away to the south. Subsequently others kept straggling out through the trees and flying south.

EASTERN KINGBIRD, *Tyrannus tyrannus*.—Several individuals, straggling along singly, took part in the movement. They usually paused for a time in the tops of the last trees before flying out over the lake.

TREE SWALLOW, *Iridoprocne bicolor*.—One.

ROUGH-WINGED SWALLOW, *Stelgidopteryx ruficollis serripennis*.—One.

BARN SWALLOW, *Hirundo erythrogaster*.—Two.

NORTHERN BLUE JAY, *Cyanocitta cristata cristata*.—Two.

(AMERICAN PIPIT, *Anthus spinoletta rubescens*.—Several southward-flying flocks of small brownish birds that, in the rush of events, were not identified at the time were probably of this species. A flock of Pipits was identified in a plowed field on Pelee Island on May 13.)

CEDAR WAXWING, *Bombycilla cedrorum*.—Numerous flocks of from twenty to fifty birds each, formed a conspicuous part of the southward-bound throng. The total number of individuals in the flocks actually seen, is believed to have been more than five hundred. The flocks often paused for a minute or less in the last trees.

STARLING, *Sturnus vulgaris vulgaris*.—Fifteen or more, in small groups.

BLUE-HEADED VIREO, *Vireo solitarius solitarius*.—One.

EASTERN WARBLING VIREO, *Vireo gilvus gilvus*.—Three.

NASHVILLE WARBLER, *Vermivora ruficapilla ruficapilla*.—A dozen or so, straggling.

EASTERN YELLOW WARBLER, *Dendroica aestiva aestiva*.—Several.

MAGNOLIA WARBLER, *Dendroica magnolia*.—Two or three.

CAPE MAY WARBLER, *Dendroica tigrina*.—Several.

MYRTLE WARBLER, *Dendroica coronata*.—Very many. The numbers of this species were estimated to be at least half of the total number of warblers observed. Myrtle Warblers often paused for a time in the last trees.

BLACK-THROATED GREEN WARBLER, *Dendroica virens virens*.—Many.

CERULEAN WARBLER, *Dendroica cerulea*.—Two.

BLACKBURNIAN WARBLER, *Dendroica fusca*.—Many of both sexes.

CHESTNUT-SIDED WARBLER, *Dendroica pensylvanica*.—Many adult males.

BAY-BREASTED WARBLER, *Dendroica castanea*.—Several.

BLACK-POLL WARBLER, *Dendroica striata*.—Two.

AMERICAN REDSTART, *Setophaga ruticilla*.—Two, one being an adult male and the other a female or a male of the previous year.

WOOD WARBLERS, *Compsothlypidae*, not specifically identified.—Large numbers.

ENGLISH SPARROW, *Passer domesticus domesticus*.—One.

BOBOLINK, *Dolichonyx oryzivorus*.—Twenty-five or more, straggling.

EASTERN RED-WING, *Agelaius phoeniceus phoeniceus*.—Several adult males, straggling.

ORCHARD ORIOLE, *Icterus spurius*.—Two adult males that were in the tops of the last trees at 6.45 a. m., when I arrived near them, flew south a few minutes later. After an interval, a male of the previous year alighted in one of these trees, remained there for a few minutes, then flew southward. No other individuals of this species were recognized.

BALTIMORE ORIOLE, *Icterus galbula*.—Many of both sexes were seen passing southward. They straggled down the point at frequent intervals and generally paused for several minutes in the tops of the last trees before they flew south over the lake.

BRONZED GRACKLE, *Quiscalus quiscula aeneus*.—Several, straggling.

INDIGO BUNTING. *Passerina cyanea*.—At least two males were seen flying south, passing the last trees without stopping. Two other males were seen later in the woods a short distance north of the last trees.

NORTHERN PINE SISKIN, *Spinus pinus pinus*.—A good many flocks, each containing from ten to fifty birds, passed southward over the point without stopping in my vicinity. It is estimated that the total number of individuals in these flocks was not less than three hundred.

EASTERN GOLDFINCH, *Spinus tristis tristis*.—Frequent flocks, each containing from five to twenty birds, passed the last trees without stopping. The total number of individuals seen is believed to have been not less than one hundred fifty.

EASTERN GRASSHOPPER SPARROW, *Ammodramus savannarum australis*.—One.

It would be interesting to know the localities in which this southward-bound stream of birds originated. On May 11, an ideal day for observing birds, I had visited Fishing Point in the early morning and had traveled extensively over Pelee Island later in the day, by automobile and on foot. Yet on that day I saw no Cedar Waxwings or Pine Siskins, species that were going south from Pelee Island in hundreds on the morning of May 12. On May 11, I saw of Goldfinches only five, of Baltimore Orioles only two, and of Red-headed Woodpeckers only two, yet these species ranked as common to abundant in the southbound flight of birds on the following morning. Whence did they come? They may have been on Pelee Island on May 11 without my noting any indication that they were so numerous there, but I do not think so. Did they arrive from the south in the night of May 11–12, only to turn back across the southern part of Lake Erie after daylight on the morning of the 12th, or did they come to Pelee Island from the mainland on the north, either during the night of May 11–12 or on the following morning, shortly before I saw them at Fishing Point? Had other observers of migration been stationed, on the morning of May 12, at other points along this migration route, so that observations of bird movements at several places, from one side of the lake to the other, could have been made

simultaneously, we might be able to answer this question and others of interest.

The list of species that participated in this southward flight presents several features of particular interest. It contains not only species that were then transients in the region, such as the various warblers, and late-nesting species, such as the Goldfinch and the Cedar Waxwing, but also representatives of species most of whose local resident individuals were at that time well advanced in nesting activities. In this group may be included the Mourning Dove, Starling, English Sparrow, Eastern Red-wing, and Bronzed Grackle. It is also worthy of note that many of the birds taking part in full daylight in this southward movement across broad water areas were of weak-flying types, such as vireos, warblers, and orioles, which are commonly believed to make extended migratory flights only at night.

The absence from this list of various species of birds that were then common in the region in which these observations were made, is also interesting. Species of land birds that were observed to be common on Pelee Island on May 11–12, 1937, but that were not seen to participate in this southward movement are the following:

RING-NECKED PHEASANT, *Phasianus colchicus torquatus*.—Nesting birds.

EASTERN CROW, *Corvus brachyrhynchos brachyrhynchos*.—Presumably nesting birds.

EASTERN HOUSE WREN, *Troglodytes aëdon aëdon*.—Probably both transients and local residents.

EASTERN ROBIN, *Turdus migratorius migratorius*.—Doubtless nesting birds.

OLIVE-BACKED THRUSH, *Hylocichla ustulata swainsoni*.—Transients.

EASTERN RUBY-CROWNED KINGLET, *Corthylio calendula calendula*.—Transients.

BLACK AND WHITE WARBLER, *Mniotilta varia*.—Probably both transients and local residents.

WESTERN PALM WARBLER, *Dendroica palmarum palmarum*.—Transients.

NORTHERN YELLOW-THROAT, *Geothlypis trichas brachidactyla*.—Probably both transients and local residents.

EASTERN MEADOWLARK, *Sturnella magna magna*.—Presumably local residents.

EASTERN COWBIRD, *Molothrus ater ater*.—Presumably local residents.

EASTERN CARDINAL, *Richmondena cardinalis cardinalis*.—Residents, probably nesting.

WHITE-CROWNED SPARROW, *Zonotrichia leucophrys leucophrys*.—Transients.

WHITE-THROATED SPARROW, *Zonotrichia albicollis*.—Probably transients only.

SONG SPARROW, *Melospiza melodia* (subsp.?).—Probably residents only.

With the exception of the Myrtle Warbler, warbler species that were common in the southbound flight on the morning of May 12, including undoubted transients, were numerous on Pelee Island throughout the day. A marked 'wave' of migrating warblers was present. In the afternoon, in woods northeast of West Dock, Blackburnian, Black-throated Green, Nashville, and Magnolia Warblers were especially plentiful. Myrtle War-

blers, though particularly numerous in the southbound throng on the morning of May 12, were not found by me on Pelee Island in the afternoon of that day.

Some outstanding students of bird migration have held the opinion that the wind, unless so high as to be unfavorable from its very strength and turbulence to any migration, exercises little influence upon the progress of migratory flights. Thus Eagle Clarke (11, 1: 178) says: "The importance of winds in connection with bird-migration has been much overestimated, and their bearing upon the phenomenon, such as it is, greatly misunderstood. Their direction, apart from the weather conditions to which they are due, has no influence whatever on the movements." Cooke (5) states that "during spring migration the direction of the wind seems to have little if any effect on the arrival of the birds." Thomson (29, p. 105) concludes his consideration of this matter with the following remark: "Examples might be multiplied, but all would lead to the same conclusion that the direction of the wind is an unimportant factor, and that when migrants travel with the wind it is a coincidence—the migration and the wind are not directly related, but are respectively influenced and caused by the pressure conditions at the point of origin." Wetmore (34, p. 56), while giving little consideration to this question, says: "The northward flight of migrants in general is initiated when wind and temperature are favorable."

During the last decade, following the establishment of permanent stations for scientific study of bird migration at several favorably located places on the continent of Europe, a good deal of attention has been paid, especially by ornithologists of Holland and Germany, to the relation between bird migration and the wind. It has been observed that some birds, such as the Hooded Crow, *Corvus cornix*, and the Rook, *C. frugilegus*, migrate with little regard to weather conditions, while the migrations of a great many birds are much influenced, in one way or another, by the weather. Weigold (32) has proposed the term 'instinct birds' for those birds that migrate regularly, no matter what the weather, and the term 'weather birds' for those whose migrations the weather affects. Koch (18) has termed the relation between the direction of bird migration and the direction of the wind 'anemotaxis' and has divided the 'weather birds' into the 'positively anemotactic,' which tend to fly contrary to the direction of the wind, and the 'negatively anemotactic,' which tend to fly with the wind. When the direction in which the wind blows is exactly the direction normal for the migration and the positively anemotactic birds, flying directly into the wind, migrate directly away from their presumed destination, the phenomenon is termed '*cursus retroversus*.' Koch cites numerous examples of such occurrences, observed by him and others in Holland and Germany. His detailed account of the relation of bird migration to the wind is said to be based on ten years' ob-

servations on the coast of Holland and to be corroborated by the practical experience, extending over a much longer period, of the professional bird-catchers of that region. His examples are selected from observations of autumn migration.

Reverse flights in spring of certain European passerine birds, including at various time fringillids, wagtails, pipits, starlings, thrushes, redbreasts, and larks, are described by Poncy (23) and by Natorp (21, 22). These cases, however, appear not to be characterized by flight against a wind blowing in the normal direction of migration, but to be due to the fact that the migrants concerned had, in their progress northward, encountered low temperatures, snow, or other unfavorable weather conditions, which forced them to make a temporary retreat. Such instances have been distinguished in Europe under the term 'retromigration' and should not be confused with '*cursus retroversus*,' as defined in the preceding paragraph.

While it would be rash to attempt to form or to present, on the basis of a single observed instance, a theory as to the cause of the apparent tendency of some birds to fly against the wind or the way in which the cause produces the effect observed, yet the known facts in connection with the occurrence of *cursus retroversus* at Pelee Island on May 12, 1937, do seem to afford grounds for certain comments on the general subject and on some of the theories about it that have already been advanced. Drost and Bock (9), for example, speaking of instances of *cursus retroversus* in autumn migration, when birds whose normal course in that migration was southwest flew northeast against a northeast wind, express the view that this occurrence was not due merely to the fact that there was a northeast wind, but to the fact that this wind, as an exception, brought with it warm masses of air. It is apparently their idea that autumn migrants instinctively seek warmer regions and are therefore influenced to fly toward a warm wind, even when it blows from the northeast. That is, they would attribute *cursus retroversus* to a reversal of normal temperature change and of normal geographical distribution of air temperatures. Normal migration flights in spring are generally accompanied by rising temperature at the point of departure and produce progress into regions where the temperature is lower than at that point. Normal migration flights in autumn, on the contrary, are generally accompanied by falling temperature at the point of departure and produce progress into regions where the temperature is higher than at that point. Temperature conditions that may play a part in occasioning migratory flights must be only those at the point of departure, but, once the migrants are in flight, normal temperature changes as they advance may conceivably induce them to continue until a normal flight is completed. If *cursus retroversus* is due to a reversal of normal temperature change and of normal geographical distribution of air temperatures, then in spring it should be ac-

companied by a falling temperature at the point of departure and should be a movement southward through regions of successively lower temperatures. But the temperature on Pelee Island at 7.00 a. m. on May 12, 1937, was 7° F. higher than it was at the same hour on the preceding day. The weather map of the United States Weather Bureau for May 12 states, concerning the twenty-four hours previous to 7.30 a. m.: "The temperature has risen from the Mississippi Valley eastward to the Atlantic coast." The mean between maximum and minimum temperatures on Pelee Island on May 12 was 60° F., while the corresponding mean at Sandusky, Ohio, sixteen miles to the south, was 65° F., or 5° higher. The birds that I saw migrating southward in the time of spring migration were setting out in a period of rising temperature and were proceeding to a region of higher temperature. My observations do not, therefore, support the above-mentioned theory of Drost and Bock.

In the same paper these authors suggest that *cursus retroversus* may be understood only in case the sky is overcast, so that the migrating birds cannot see and be guided by the positions of the heavenly bodies, or in case, in the species affected, reaction to the visible positions of the heavenly bodies is non-existent or is overcome by some stronger reaction. Koch (18), commenting on this view, states that *cursus retroversus* often occurs at Wassenaar, in the Netherlands, on sunny days. During the time of my observation of this phenomenon on May 12, 1937, the sky was partly clouded and the sun was not visible.

The possible relation of *cursus retroversus* to barometric pressure, especially to its geographical distribution, may be considered. The principal center of the area of low pressure in which Pelee Island was included on May 12, 1937, had a pressure of 29.4 and was, at 7.30 a. m., near Sioux Lookout, Ontario, 780 miles distant from Pelee Island in a direction somewhat north of northwest, and was moving toward the east. There was a lesser center, with a pressure of 29.8, near Oklahoma City, Oklahoma, about 900 miles distant toward the southwest. There was a center of high pressure, with a maximum of 30.3, over the Atlantic Ocean not far east of Atlantic City, New Jersey, or 500 miles distant to the east-southeast, and another high-pressure center, with a maximum of 30.2, near Concord, New Hampshire, or 575 miles distant toward the east-northeast. The birds that I saw flying south from Pelee Island were not directing their course toward any of these high or low centers. They were not fleeing from a stormy area, for there was no stormy weather anywhere within 200 miles to the northward of Pelee Island and the northern center of low pressure was taking a course that would not bring it within 500 miles of the island. If they maintained their southward course for a few miles, these birds would experience slightly lower pressure, for the barometric pressure at Sandusky, Ohio, at 7.30 a. m.

was 29.88, which may be compared with Pelee Island barometric pressures of 29. 97 at 7.00 a. m. and 29.92 (minimum for the day) at 10.50 a. m., 12.45 p. m., and 3.40 p. m. It does not, however, appear possible for a bird, whether remaining stationary or making short local flights, to have any perception of the direction in which an area of barometric pressure lower or higher than that at the bird's position is to be found. Unless and until it is shown that a bird may have a perception of a different barometric pressure at a distance in a particular direction, any assumption that it is capable of this kind of perception is unwarranted and it is not useful to try to make it the basis of theories about the phenomenon of *cursus retroversus*. There is a possibility that the condition of falling barometric pressure that existed on Pelee Island on the morning of May 12 may have had something to do with the occurrence of a reverse migration, but if such a condition regularly produces such a result we should expect reverse migration to be far more common than it appears to be. It may also be noted that, although the barometric pressure on Pelee Island on May 11, 1937, fell from 30.31 at 7.00 a. m., to 30.17 at 5.45 p. m., and on May 13, after rising slightly from 30.01 at 7.00 a. m., to 30.04 at 10.55 a. m., diminished slowly to 29.98 at 5.45 p. m., my observations on the island, including those made during daily visits to Fishing Point, failed to show any southward flight on either of these days. Both days were calm throughout most of the morning. On May 11, a brisk southeast wind blew during the afternoon and on May 13 there was a light north wind at 4.40 p. m. and 5.45 p. m. May 11 was bright and sunny; on May 13 the sky was almost entirely overcast.

As to the view advanced by Koch (18), that there exists such a relation as anemotaxis, or a connection between the direction of the wind and the direction of bird migration, and that positive anemotaxis, or a tendency for certain birds to migrate against the wind, may, on occasions when the wind blows in the direction in which migration normally takes place, result in the occurrence of *cursus retroversus*, or migration in a direction opposite to the normal one, the following remarks may be offered. A bird resting on a perch may be, and presumably is, aware of the direction of the wind in much the same way that we are, namely, through feeling the pressure of moving air against its windward side. There is therefore no difficulty in understanding how a bird may start to fly against the wind. Once the bird has loosed from stationary objects and launched into the air, its relation to the wind is greatly changed. It is then supported by the stream of air surrounding it and has no solid attachment to anything. It cannot then apprehend the direction of the wind by any pressure of the latter against its body, for, aside from the possible effect of turbulence, the air pressure against its body would be the same on all sides if the bird allowed itself to be swept along as an inert object in the air current. By its own efforts in flying ahead through

the surrounding air, the bird causes increased pressure against its forward side, but this result is obtained indifferently and to the same extent whether the bird directs its flight with, or against, or across a uniform stream of air. Except under unusual circumstances, the flying bird therefore presumably has no awareness of the direction or the velocity of the wind or of the direction or velocity of its own movement in relation to the surface of the earth or in relation to the direction or velocity of the wind unless it can perceive some fixed points on the earth or, for knowledge of direction but not of velocity, some recognizable heavenly body or bodies. It may also be presumed that it usually has such awareness as a result of seeing the surface of the earth. Anemotaxis in any form is, of course, not due to the effect of the wind on the plumage of the bird concerned, for a wind, whether favorable or contrary, will not ruffle the plumage of a freely air-borne bird any more than calm air will, for in either case the bird and the surrounding air do not move in relation to each other except as the bird propels itself or falls through the air. Turbulence may, it is true, have at times a slight effect, but it is very doubtful if, in the case of a moderate wind in the open, turbulence is sufficient to disarrange the plumage of a flying bird or to cause it to fly in a particular direction. When a steamship and the wind are proceeding in the same direction with the same velocity, the air on deck seems very still. One may then note that there is no effect of turbulence sufficient to stir the flag that hangs idly against its staff or to prevent innumerable light flakes of soot from showering gently down upon the ship. I know of no factual grounds for attributing to turbulence the power of producing a significant disturbing effect on birds making long flights except when the wind is of such high velocity that most small land birds do not undertake such flights. That turbulence is more disagreeable or more helpful to a bird flying in any particular relation to the direction of the wind than to that bird flying in any other relation to that direction still appears to be merely hypothetical. Manifestations of anemotaxis are, therefore, probably not possible unless the bird in flight can see the surface of the earth and thus have awareness of the direction of the wind and of its own progress in relation to the wind and to fixed objects.

Acworth (1) has assumed that birds migrating across the sea head continously for a fixed although unseen location and has shown that, in such circumstances, birds flying in a wind that is not either directly against or behind them would necessarily follow a curved path and finally arrive at their destination exactly head to the wind. Whatever validity this idea may possess, the reverse migration that I have described was not due to the conditions to which he refers. The wind at Pelee Island on the morning of May 12, 1937, was moving exactly in the direction in which migration at that place should normally be moving at that season. It may be noted al-

so that many of the birds that were flying south from Pelee Island that morning, such as the Blue-headed Vireo, Magnolia Warblers, Cape May Warblers, Myrtle Warblers, Bay-breasted Warblers, Black-poll Warblers, and Pine Siskins, do not nest in the regions lying southward from that island and therefore were not heading toward the destination of their migration. Neither were these birds merely in the situation described by von Holst (15), who has pointed out that a bird endeavoring to follow a fixed course while flying with a side wind can succeed in its attempt only by turning the axis of its body to some extent toward the wind, in order to offset drift or leeway. In the first place, a bird flying under the conditions described by von Holst will never be heading directly into the wind, but always in a direction intermediate between the direction in which it is actually progressing and the direction from which the wind is blowing. In the second place, these conditions can never cause a bird to head in a direction making an angle of more than 90° with its true course. Any wind striking the bird at an angle with its yet-to-be-traversed route that exceeds 90° contains a favorable component and the greater this component the smaller will be the angle between the axis of the bird's body and the line of the route to be traversed. Finally, the resultant of forces under these conditions will be progress directly along the bird's normal migration route, unless the velocity of the wind is greater than the bird's speed through the air, in which case the bird will be blown down wind. Therefore it is impossible for conditions such as those the existence of which is assumed by von Holst to produce *cursus retroversus*, or to cause birds to head in a direction within 90° of the direction of a reverse flight, or to cause them to fly exactly against or with the wind in any direction.

In the case of the numerous warblers of various species that I found moving southward against the wind by flitting from tree to tree on the densely wooded part of Fishing Point, where the thick foliage of the red cedars provided abundant shelter from the force of the wind, it is evident that the apparent anemotaxis thus displayed was not primarily, if at all, a utilization of any possible physical advantages to be found in flying against the wind nor an avoidance of any possible physical disadvantages or risks to be incurred by flying with the wind. In the sheltered spaces among the evergreens the birds were physically free to flit in one direction as well as in another. The fact that they were, nevertheless, moving continually southward against the wind, toward the last trees on the point, whence their southward journey was continued by a long flight in the open, appears to indicate either that their orientation was not governed by the wind or, what I deem more probable, that such movement to windward is not now directly related to any possible favorable physical factor or factors connected with flight against the wind, but points to some instinctive reaction to wind

direction that, under certain conditions, may be irrepressible in many birds and that, whatever its origin, may at times lead to flight that is more or less disadvantageous and even risky to the birds that perform it.

It seems to me that my observation of *cursus retroversus* is not out of harmony with the theory of Koch and that there are serious objections to the alternative ideas that have been proposed. Why and how some birds may be so influenced by the direction of the wind that they migrate directly against it, even when this involves reversing their normal course, and why all the individuals of a species in a given region at a given time do not behave alike in this regard are questions requiring thorough investigation. (Lorenz (20) has advanced very plausibly the idea that birds have a psychological dislike for flying with the wind, at least at low elevations, because then, like a motorboat running down a stream with a swift and turbulent current, their course is difficult to control, they cannot stop at will nor even advance slowly, and they must turn around and face against the current before they can make a safe landing. Reasons for not flying with the wind are, however, not necessarily reasons for flying directly against the wind.) There is also need to reconcile observations on bird migration in relation to the wind, including observed instances of *cursus retroversus*, with other observed facts of migration, including the regular annual arrival of some migrant species and the repeated return of individual birds to the same breeding areas and wintering grounds. Even a partial solution of these problems will probably improve our comprehension of the factors that govern the orientation and progress of bird migration in general.

The fact that reverse migration is so little known in North America is due, I believe, to failure to give special attention to continued studies of bird migration at the favored points where natural conditions cause migratory activity to be concentrated, frequent, and comparatively easy to observe. The establishment in Europe of permanent, well-equipped stations for the purpose of studying bird migration at favored places of this kind soon had for one of its results a realization that reverse migration is by no means rare and that its significance should be carefully investigated. If a line of research stations could be established along the Point Pelee—Pelee Island—Ohio migration route or at other places of equal suitability and an intensive, cooperative study of migration carried on, there is little doubt that valuable data would accumulate rapidly and that a great deal of new light would be thrown, not only on the problem of reverse migration, but also on many of the other puzzling questions relating to the migration of birds.

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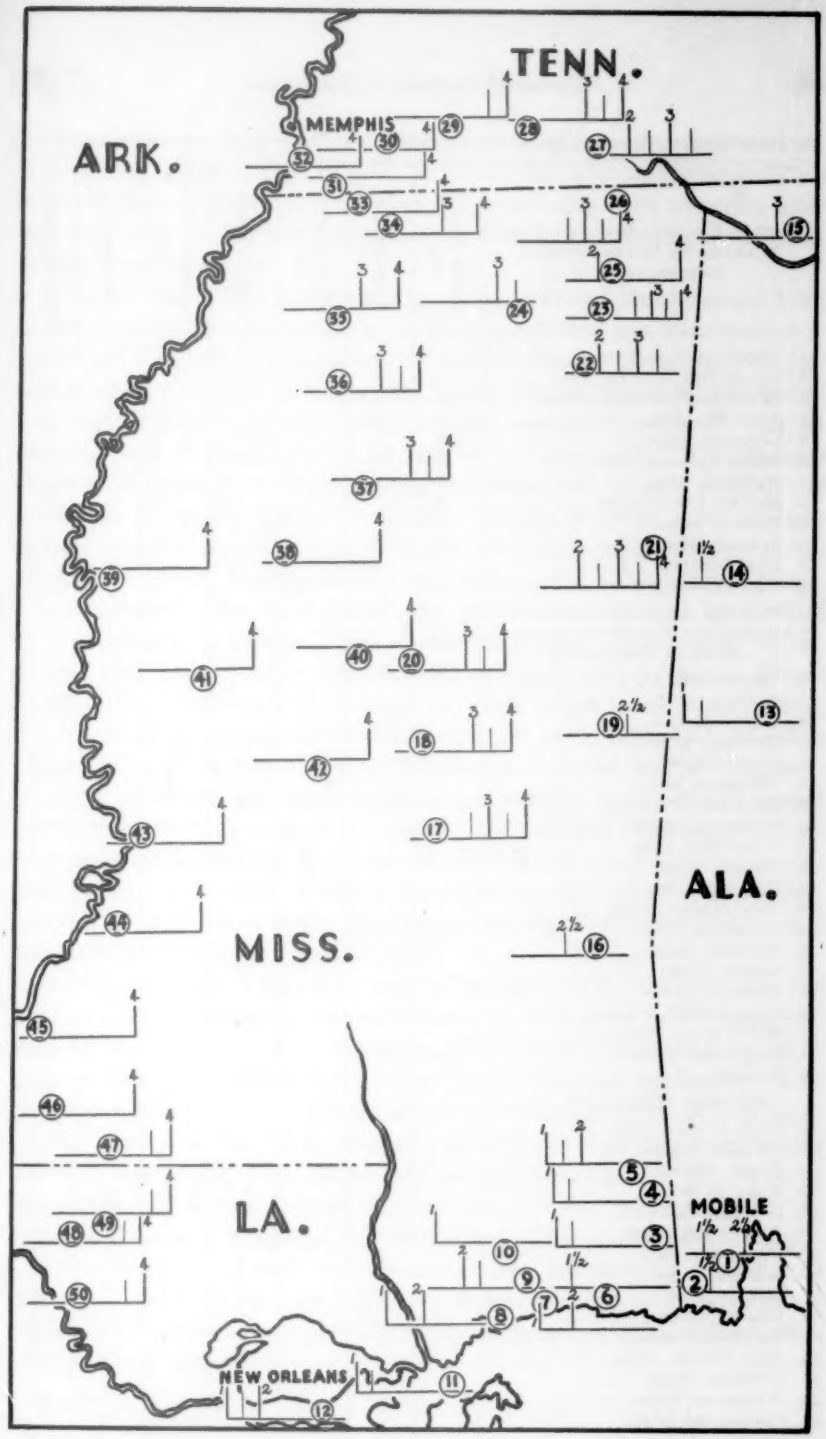
QUISCALUS IN MISSISSIPPI

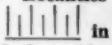
BY FRANK M. CHAPMAN

SINCE the publication of the latest of my three reports in 'The Auk' (52: 21–29, 418–420, 1935; 53: 405–417, 1936) on the distribution and relations of grackles I have secured material for a further study of these birds. Dr. Thomas Barbour has sent me specimens from the islands of Nantucket and Martha's Vineyard; Dr. Stanley C. Ball, from the vicinity of New Haven; Messrs. Roy Latham, Winston Guest, and Leroy Wilcox, Drs. William Tod Helmuth, 3rd, and Eugene Swope, Mrs. Gladys Gordon Fry and the American Museum's collector, Sven Raven, from Long Island; Mr. Charles H. Rogers, from Princeton, New Jersey; S. K. George and Thomas W. Hull, from Maryland; Herbert L. Stoddard, from the Thomasville, Georgia, region; Mr. Thomas D. Burleigh, from coastal Mississippi, and Mr. E. A. McIlhenny from throughout that State and its borders. The Mississippi-area collections made during May 1937 and 1938, chiefly by Mrs. Rosamond Lockett Ballard for Mr. McIlhenny, include 358 males and compare in thoroughness with those previously made under Mr. McIlhenny's direction in Louisiana. They therefore warrant an attempt to extend our knowledge of the distribution and relations of *Quiscalus* eastward and northward from that State. Later I hope to acquire equally adequate collections from other critical areas in the range of this species.

In resuming this study, I may be permitted to restate briefly the theory advanced to account for existing conditions. Thus, I have suggested that during the last Glacial Period the two ancestral forms of grackles were confined respectively to southeastern Texas and the peninsula of Florida. With the retreat of the ice, both began to move northward. Because of unfavorable conditions *aeneus* did not cross the Sabine River and enter Louisiana until the coastal marshes had been passed. Thence it ranged eastward across Louisiana to Mississippi.

The Florida Grackle, in beginning its post-glacial journey, went northward and also westward. In the latter direction it reached Port Arthur, southern Louisiana, where its further westward progress was apparently stopped by the eastern border of the treeless region, the western margin of which appears to have prevented the eastward distribution of *aeneus* at this point. The Florida Grackle evidently extended its range not only westward along the coastal region, but northward into the interior. In Louisiana (see map, Auk, 53: 412, 1936) it went north until, on an east and west line, it met the southern limits of the range of *aeneus*. Here, presumably for the first time, the two met and interbred, producing *ridgwayi*. Our studies show that throughout a band about forty miles wide this interbreeding still continues. North of this line only pure *aeneus* is found; south of it only *stonei*



TEXT-FIG. 1.—Distribution of *Quiscalus* in Mississippi. **Localities are numbered, in circles. Form of grackle present indicated by the symbol**  **in which the longer marks represent respectively: 1, *Q. q. quiscula;* 2, *Q. q. stonei;* 3, *Q. q. ridgwayi;* 4, *Q. q. aeneus.* The shorter marks stand for intermediates. (See accompanying table.)**

DISTRIBUTIONAL TABLE OF *Quiscalus quiscula* FROM MISSISSIPPI AND ADJOINING AREAS

	Florida Grackle No. 1	*Intermediates*	*Stone's Grackle No. 2*	*Intermediates*	*Ridgway's Grackle No. 3*	*Intermediates*	*Bronzed Grackle No. 4*
COASTAL REGION: SOUTHWESTERN ALABAMA TO SOUTHEASTERN LOUISIANA							
1. Theodore, s. w. Mobile, Ala.		1		1			
2. Grand Bay, Mobile, Ala.		1					
3. 11 mi. south Hurley, Miss.	5	5					
4. Agricola, Miss.	2	2					
5. Lucedale, Miss.	1	6	2				
6. Ocean Springs, Miss.		3					
7. Gulfport, Miss.	1		2				
8. Bay St. Louis, Miss.	2		1				
9. Lyman, Miss.			1	1			
10. Saucier, Miss.	1						
11. Chef Menteur, La.	1	2					
12. New Orleans, La.	1	1	4				
WESTERN ALABAMA, EASTERN MISSISSIPPI, NORTH TO SOUTHWESTERN TENNESSEE							
13. Greensboro, Ala.	2	6					
14. Reform, Ala.		1					
15. Leighton, Ala.					2		
16. Shubuta, Miss.				1			
17. Forest, Miss.				2	2	3	2
18. Carthage, Miss.					2	2	5
19. De Kalb, Miss.				1			
20. Kosciusko, Miss.					1	3	5
21. Columbus, Miss.			9	4	3	3	1
22. Tupelo, Miss.			6	1	2	2	
23. Baldwyn, Miss.				2	5	1	2
24. New Albany, Miss.					1	1	
25. Boonville, Miss.			1				7
26. Corinth, Miss.				1	1	3	5
27. Selmer, Tenn.			1	1	4	3	
28. Bolivar, Tenn.					1	1	4
29. Summerville, Tenn.						1	6
30. North Eads, Tenn.							5
31. Capleville, Tenn.							9
32. Memphis, Tenn.							14
WESTERN MISSISSIPPI							
33. Olive Branch, Miss.							1
34. Byhalia, Miss.					1		3
35. Como, Miss.					1		9
36. Pope, Miss.					1	4	7
37. Grenada, Miss.					1	2	6
38. Greenwood, Miss.							10
39. Greenville, Miss.							10
40. Durant, Miss.							9
41. Louise, Miss.							10
42. Canton, Miss.							1
43. Vicksburg, Miss.							10
44. Port Gibson, Miss.							10
45. Natchez, Miss.							11
46. Wilkinson, Miss.							10
47. Centreville, Miss.						2	8
48. Lindsay, La.						5	13
49. Olive Branch, La.						3	7
50. E. Baton Rouge, La.						1	2

and its variants toward the Florida bird from which it is apparently derived. It should be remarked that in spite of the fact that although intergradation between these forms is complete and has presumably been occurring since first they met, we still find typical individuals of each breeding in the same colony (see Text-fig. 1).

If, in entering Mississippi, I had attempted to extend the east-south limit of the range of pure *aeneus* solely on the basis of what had been learned in Louisiana, I should have continued it eastward across Mississippi to Alabama before turning northward. But, to my surprise, in central Mississippi this line abruptly turns northward to enter western Tennessee. The remaining part of Mississippi is an area of intergradation. The Bronzed Grackle decreases in numbers as we go eastward and, in pure form, is unknown in Alabama. The *quiscula-stonei* complex becomes more common toward the east, but, except in the coastal region, is unknown west of the Mississippi River. Details are given in the chart and accompanying tables. The conditions which they reveal may possibly be explained by the fact that Mississippi is nearer to the theoretical Glacial-Period home of the Florida bird than it is to the corresponding area occupied by *aeneus* in Texas. When in the post-Glacial Period the two birds began to move northward, the Florida bird, having the shorter distance to go, appears to have taken possession of Alabama and entered Mississippi as *aeneus* was arriving from the west. There is no evident topographic cause for the change from east to north in the range extension of *aeneus* after entering Mississippi and we may therefore assume that it was due to prior occupation of the more eastern field by the Florida bird. If this suggestion be considered plausible, it offers support for the theory of the post-glacial dispersal of *quiscula* and *aeneus*, respectively, from Florida and Texas.

Beyond this point I am not at present prepared to go. In extending the field of our investigations eastward from Mississippi we will presumably soon leave evidences of *aeneus* behind and be concerned with an attempt to discover how *stonei* has developed from the Florida bird (*quiscula*). Since suggesting that *stonei* is a mutant of *quiscula* which, whether it goes north to New Jersey or west to Louisiana, gradually develops the characters of *stonei*, I have acquired no further material throwing light on this problem. Meanwhile, I venture to hope that in another year we shall know the grackles of Alabama and Georgia as we do those of Louisiana and Mississippi.

At the same time I trust that we may acquire adequate collections from our own doorstep, in the New York City region, and thus be in a position to explain why *ridgwayi* is the prevailing, almost the sole, grackle of the eastern third of Long Island.

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ADAPTABILITY OF BIRDS TO CHANGED ENVIRONMENT[1]

BY LOGAN J. BENNETT AND GEORGE O. HENDRICKSON

Plate 3

DURING recent years much has been written and spoken concerning the conservation, preservation, and perpetuation of many species of wildlife, particularly waterfowl. In the waterfowl-breeding areas of Iowa many remedies have been suggested to convert the remaining marshes into more habitable environment for marsh-dwelling birds. The most common, and perhaps the most logical idea put forth was that the State or Federal Governments purchase large tracts of marsh and tilled upland and let them revert to pre-agricultural conditions. Much of the drained land surrounding the Iowa marshes, however, is of a high type of corn-producing soil. From the standpoint of economics, thirty to forty bushels of corn to an acre may mean more to the welfare of the State than one duck's nest to an acre. Thus in a highly agricultural region the ecologist who is interested in the perpetuation of wildlife is immediately confronted with a number of conflicting economic and aesthetic viewpoints. So far as some of the prairie and marsh birds are concerned, just what has happened in tall-grass-prairie-marsh country that has become highly agricultural?

From 1932 to 1937, inclusive, the senior writer spent several months each year in Clay and Palo Alto Counties (Text-fig. 1), in the vicinity of Ruthven, Iowa. The junior author made periodic visits to the area from 1924 to 1937. That section, within the Wisconsin glaciation, represents the remnant of the southernmost tip of a series of lakes and marshes extending south from eastern South Dakota and western Minnesota. Each year during the period of observations (1932–37), exhaustive data were collected on the nesting and migration of the birds. In 1914, A. D. Tinker recorded a number of birds found in that region by the Michigan-Walker expedition during the summer of 1907.

Many changes have occurred there since 1907. At that time about fifteen per cent of the upland was native prairie; in 1937 only two small patches of prairie were found, one of three acres and another of one acre. The margins of nearly all marshes, potholes, and lakes have been grazed, mowed, or cultivated since 1907. The dominant vegetation in the unplowed margins is bluegrass (*Poa pratensis*). In the wet meadows sloughgrass (*Spartina Michauxiana*) still persists. Since 1907, trees around the water areas—bur oak (*Quercus macrocarpa*), ash (*Fraxinus pennsylvanica lan-*

[1] Journal Paper No. J566 of the Iowa Agricultural Experiment Station, Ames, Iowa. Project 496. Iowa State College, Iowa Conservation Commission, and the U. S. Bureau of Biological Survey cooperating with the American Wildlife Institute.

FIG. 1.—ELBOW LAKE IN 1907. (Reproduced from Tinker's article.)

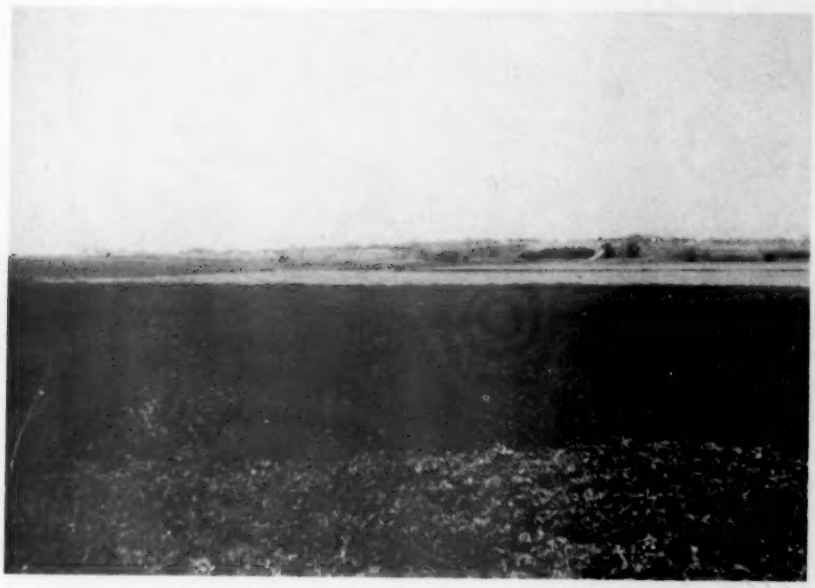

FIG. 2.—ELBOW LAKE IN 1937.

The light area in the background is a ripe oat field, and not water.

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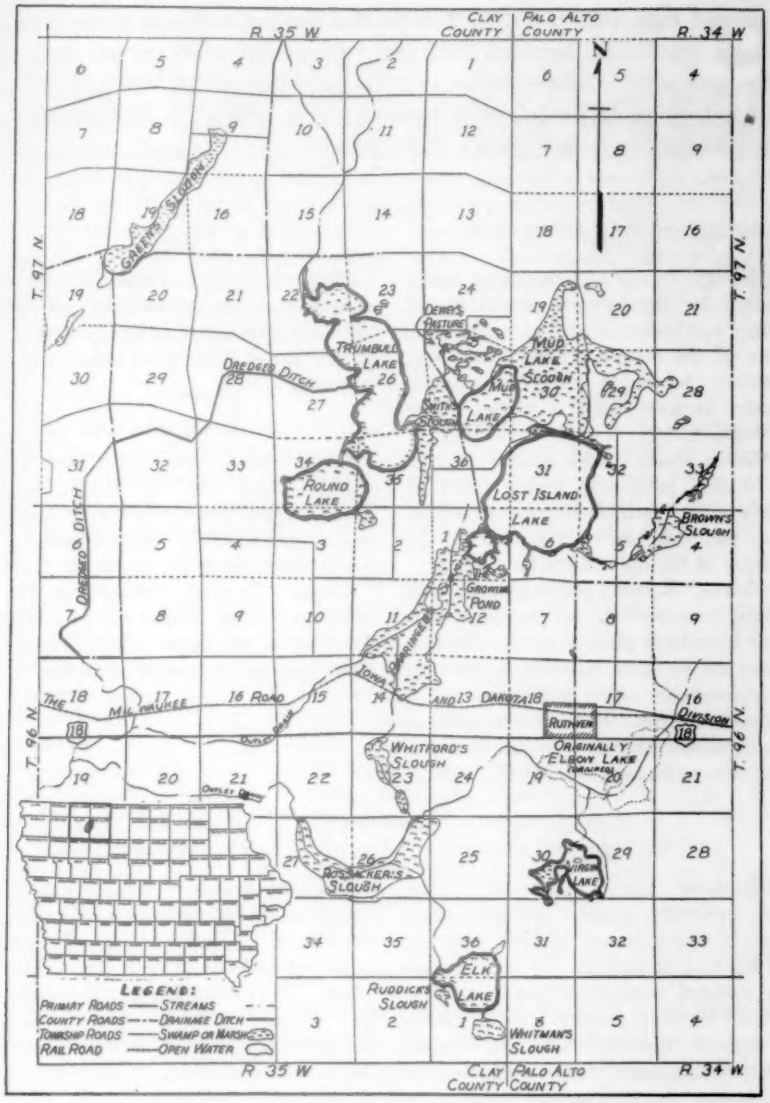

(*Courtesy of the Collegiate Press, Inc., Ames, Iowa.*)

TEXT-FIG. 1—The Ruthven Area.

ceolata), willow (*Salix* spp.), box elder (*Acer Negundo*), and elm (*Ulmus americana*)—have grown into large trees. The margins of all marshes, with the exception of those in one 392-acre tract, Dewey's Pasture, were grazed

or mowed from 1932 to 1937. This section did not suffer so severely from drought conditions between 1932 and 1937 as did areas several hundred miles west of it. Differences between the environment of 1907 and that of 1937 are shown in the following paragraphs, in which the 1907 evaluation is taken directly from Tinker's (1914) paper:

UPLAND

1907	1937
"*Upland Prairie.* Uncultivated areas, covered by the original vegetation of grasses and herbs, are still to be found on some of the ridges. These areas are, however, becoming fewer in number yearly, as more land is placed under cultivation."	*Upland Prairie.* Practically all the upland is under cultivation. In 1937 only two patches of native prairie were found, one of three acres and another of one acre.
"*Grain Fields.* The greater part of the higher land has, within the past thirty years, been placed under cultivation, and this has been mostly at the expense of the upland prairie areas."	*Grain Fields.* The grain fields have extended into all the upland prairie areas. Those tracts too steep for cultivation are used for pasture, and as a result bluegrass is the dominant plant.
"*Groves.* In many places groves of soft maple, cottonwood, willow, and box-elder have been planted on the uplands. These are so open, however, as to have no appreciable effect on the terrestrial vertebrate fauna, with the exception of the birds, the local distribution of which they are profoundly modifying."	*Groves.* The only remaining groves in 1937 were those around farm buildings. Practically no under cover exists in these groves because of grazing.

LOWLAND

1907	1937
"*Lowland Prairie* (Meadows). The low, generally poorly drained, areas have in many instances been reserved for hayland or pasture. In some places the original vegetation has been supplanted by tame grasses; in other places it remains undisturbed. The original vegetation consists of a dense growth of tall grasses and herbaceous forms."	*Lowland Prairie.* Bluegrass has invaded about half of the lowland acreage because of grazing. In the overgrazed parts squirrel-tail grass is the dominant plant. The vegetation on the remaining half of the lowland is composed almost wholly of sloughgrass. Years of mowing have eliminated many of the herbaceous plants in the sloughgrass tracts.
"*Swamps* (*Sloughs*). The swamps are mostly devoid of trees and filled with rank growths of grasses and sedges. The vegetation grows principally in clumps and on hummocks composed of roots and decaying vegetation. They are mostly uninfluenced by man, except as they are drained."	*Swamps* (*Sloughs*). The vegetation of the swamps is primarily the same as that found in 1907. About one-third of the swamp areas have been drained since that time.

LOWLAND (cont.)

1907	1937
"Shores of Lakes and Streams (Marginal Forests). This habitat supports the only natural timber in the region, and, where undisturbed, there is always a comparatively dense growth along the shores of the streams and larger lakes. The timber zones are, however, much narrower, and the trees more scrubby, than in the southern parts of the State. In most places at the present time this timber has been largely removed."	*Shores of Lakes and Streams* (Marginal Forests). Bur oak and haw trees are found on the high uplands immediately adjacent to the larger water areas. Willows and cottonwoods are the dominant trees found bordering the marshy areas. Many of the trees are larger and more mature than those observed in 1907.

AQUATIC

1907	1937
"The aquatic life is found in the lakes, ponds, sloughs and streams. The conditions in these habitats are very similar, as the lakes are for the most part shallow and the streams slow-flowing."	The aquatic life in the existing water areas consists primarily of the same forms as found in 1907. The aquatic flora has changed much less than has the flora of the upland and the lowland.

WATER AREAS[1]

1907		1937
Green's Slough	250 acres	Shallower.[2]
Lost Island Lake	1,260 acres	8 feet shallower.
Trumbull Lake	1,190 acres	4 feet shallower.
Smith's Slough	200 acres	One-fourth drained.[3]
Mud Lake	1,702 acres	Shallower, one-third drained.
Barringer's Slough	1,430 acres	One-fifth drained.
Brown's Slough	200 acres	2 feet shallower.
Elbow Lake (Pl. 3, fig. 1)	700 acres	Drained (Pl. 3, fig. 2).
Rossacher Slough	681 acres	Four-fifths drained.
Whitford Slough	193 acres	Four-fifths drained.
Virgin Lake	200 acres	About the same.
Elk Lake	261 acres	3 feet shallower.
Several hundred potholes		About three-fourths of them drained.

With these changes in environment one would expect a great change in the status of the breeding birds. In the region as a whole, however, from 1932 to 1937 were found the same species as had bred there thirty years before. The number of individuals was no doubt less, but the number of species was greater in 1937. Tinker (1914) records 86 species observed; the present writers have records of 193. There are listed below data on the breeding birds in the region. The writers took only those records of birds from Tinker's list that he recorded as having nests or young. The limited

[1] Evaluation of the water areas for both periods was made by the present writers.
[2] Shallowness caused primarily by siltation.
[3] Drainage by ditches and tile conduits.

BREEDING BIRDS	1907	1932–37
Colymbus nigricollis californicus	Not recorded	10–20 nests yearly
Podilymbus podiceps podiceps	Recorded	100–150 nests yearly
Butorides virescens virescens	Recorded	10–20 nests yearly
Nycticorax nycticorax hoactli	Recorded	50 nests, 1937
Botaurus lentiginosus	Recorded	20–30 nests yearly
Izobrychus exilis exilis	Recorded	100–200 nests yearly
Anas platyrhynchos platyrhynchos	Recorded	50–60 nests yearly
Dafila acuta tzitzihoa	Not recorded	20–30 nests yearly
Querquedula discors	Recorded	200–300 nests yearly
Spatula clypeata	Not recorded	50–75 nests yearly
Nyroca americana	Not recorded	30–40 nests yearly
Nyroca valisineria	Not recorded	One nest, 1934
Nyroca affinis	Not recorded	Four nests, 1937
Erismatura jamaicensis rubida	Not recorded	30–40 nests yearly
Circus hudsonius	Recorded	10–15 nests yearly
Perdix perdix perdix	Not recorded	10–50 nests yearly
Colinus virginianus virginianus	Recorded	Two pairs and young, 1932–1935
Phasianus colchicus torquatus	Not recorded	200–300 nests yearly
Rallus elegans elegans	Not recorded	30–40 nests yearly
Rallus limicola limicola	Recorded	100–150 nests yearly
Porzana carolina	Not recorded	100–150 nests yearly
Gallinula chloropus cachinnans	Recorded	75–100 nests yearly
Fulica americana americana	Recorded	2000–3000 nests yearly
Oxyechus vociferus vociferus	Recorded	200–300 nests yearly
Bartramia longicauda	Recorded	4–6 nests yearly
Actitis macularia	Recorded	20–30 nests yearly
Steganopus tricolor	Not recorded	5–6 nests yearly
Sterna forsteri	Not recorded	100–150 nests yearly
Chlidonias nigra surinamensis	Recorded	200–300 nests yearly
Speotyto cunicularia hypugaea	Not recorded	16 nests, 1934
Asio flammeus flammeus	Not recorded	3–6 nests yearly
Megaceryle alcyon alcyon	Recorded	5–10 nests yearly
Otocoris alpestris praticola	Not recorded	30–40 nests yearly
Telmatodytes palustris dissaeptus	Recorded	300–500 nests yearly
Cistothorus stellaris	Not recorded	300–500 nests yearly
Dendroica aestiva aestiva	Recorded	100–150 nests yearly
Geothlypis trichas brachidactyla	Recorded	100–150 nests yearly
Dolichonyx oryzivorus	Recorded	30–50 nests yearly
Sturnella neglecta	Recorded	200–300 nests yearly
Xanthocephalus xanthocephalus	Recorded	300–400 nests yearly
Agelaius phoeniceus arctolegus	Recorded	300–400 nests yearly
Molothrus ater ater	Recorded	100–150 egg-laying females
Spiza americana	Not recorded	30–40 nests yearly
Ammodramus savannarum bimaculatus	Recorded	20–30 nests yearly
Melospiza georgiana	Recorded	200–300 nests yearly

time available to the field workers of the Michigan-Walker Expedition in 1907 (July 1 to September 1) was not adequate for a complete survey of marsh and prairie birds. Thus, no doubt, some or all of the species listed by the present writers but not recorded by Tinker may have been present in 1907. Some of the breeding species not reported in 1907, however, if present, must have been less common than in 1932–37 or they would have been noted.

From the data here presented, it appears that not a single species of marsh-nesting birds has been exterminated in the area. Eighteen species were observed nesting in 1932–37 that were not so recorded in 1907. The Blue-winged Teal and other land-nesting birds, which before the introduction of the white man's methods of agriculture nested in the native grasses, now nest in bluegrass, oats, and alfalfa. Thus from the standpoint of proper land use, perhaps ducks and other marsh and prairie birds can be managed in conjunction with good farming practices, even in a highly agricultural region. Bennett (1938, p. 102) found that a certain degree of grazing under proper conditions was conducive to more favorable nesting conditions for the Blue-winged Teal.

From all indications it seems as though much can be done and learned in evaluating environmental changes in relation to agriculture. It may be that bluegrass provides better nesting cover for the Blue-winged Teal than did the native grasses! We need to learn more about what we have before we try to make changes to produce what we desire in the conservation of birds.

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THE GENUS *OTUS* OF MEXICO AND CENTRAL AMERICA

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ALTHOUGH this study of the genus *Otus* is restricted to species occurring in Mexico and Central America, no clear picture of the situation can be drawn without references to extralimital races. Due to lack of material, Ridgway (Bull. U. S. Nat. Mus., no. 50, pt. 6, pp. 681–732, 1914) gave specific rank to many forms, such as *guatemalae*, *vermiculatus*, *vinaceus* and *hastatus*. In 1918, Cory (Cat. Birds Americas, pt. 2, no. 1, pp. 25–31) followed Ridgway, and accepted the new races described since Ridgway's time, making only one change, a recognition of *O. asio gilmani* Swarth, which Ridgway had synonymized with *cineraceus*. Griscom ('Distribution of Bird Life in Guatemala,' Bull. Amer. Mus. Nat. Hist., 64: 170, 1932) suggested the likelihood of the conspecific relationship of *guatemalae* and *cassini* and the "break down" in "the distinction of the feathering of the tarsus," whereby Ridgway had set up *vermiculatus* as a species. Following Ridgway and Cory, Kelso ('A Key to Species of American Owls,' pp. 45–52, 1934) recognized some new forms recently described, but did not carry out Griscom's suggestion. The senior author ('New Races of the Genus *Otus* in Northwestern Mexico,' Proc. Biol. Soc. Washington, 50: 63–68, 1937) described two new races, *O. asio sinaloensis* and *O. guatemalae tomlini*, mentioned two specimens in his collection from Vera Cruz, related to *cassini*, and three from Nicaragua, which he did not then describe (although he was confident they represented two new races) and suggested the conspecific relationship of *guatemalae*, *thompsoni*, *hastatus* and *tomlini*. The present authors accept the suggestions of Griscom and Moore and here describe a new race of *Otus trichopsis* from Honduras, as well as the two forms mentioned above. All the specimens of each species in the British Museum, including the types, were examined by the senior author during August 1938.

Our grateful acknowledgments are made to the Directors of many museums for their cooperation and generous loan of material including many valuable types: to Mr. N. B. Kinnear and the British Museum; to Dr. Herbert Friedmann and the Smithsonian Institution; Dr. Harry C. Oberholser and the U. S. Biological Survey; Mr. John T. Zimmer and the American Museum of Natural History; the late S. C. Simms and the Field Museum of Natural History. In addition Mr. Laurence Huey and the San Diego Society of Natural History loaned a topotypical series of *O. a. cardonensis;* Mrs. Donald R. Dickey and Mr. Adriaan van Rossem permitted the examina-

[1] Mr. Peters graciously insisted that the custom of the late Outram Bangs be followed in determining the position of the authors' names. Therefore the use of the terms 'senior' and 'junior author' throughout the paper refers solely to their relative ages.—R. T. M.

tion of the type of *O. trichopsis mesamericanus;* Dr. Louis B. Bishop loaned a large series of *cineraceus, gilmani* and *cardonensis;* and Dr. Loye H. Miller and the University of California at Los Angeles loaned many valuable specimens. The authors are fully aware that even the present assemblage of material, probably much larger than any hitherto gathered together, is not adequate in every case and the appearance of new data may necessitate a change of treatment.

OTUS ASIO

Specific characters.—Toes bristled; base of toes feathered; black blotches on breast conspicuously wider than black streaks of lower under parts; bristly tips to feathers of face as a rule only slightly developed; both webs of outer primaries barred; spotting on back, when present, indistinct.

The western forms of our field are not dichromatic, but apparently consist of a phase much grayer than the light phase of any of the other species of *Otus*, with the possible exception of *trichopsis*. Only *Otus asio mccallii* of our field seems to have a rufous phase.

Remarks.—The characters of the various species of *Otus* are subject to such individual variation, that not one can be set up, that will prove invariably true for every individual. In some ways the American forms of the genus *Otus* may be likened to the genus *Empidonax* in that there are several distinct species all resembling one another in external appearance, but readily recognizable by their notes and probably in life occupying distinct ecological niches. When assembled as museum specimens, they can be distinguished only with great difficulty, and none of the so-called specific characters can be relied upon with certainty. For example, the great development of bristly tips of the facial feathers is generally conceded to be the important character of *trichopsis*, by which it is distinguished from the *asio* group. Nevertheless, there are several races of *asio*, in which individuals are found with these 'bristly tips' as well developed as in any average specimen of *trichopsis*, for example in *floridanus, bendirei* and *mccallii*. The same is true of the 'spotting' on the hind neck. Furthermore, in the northern part of its range *trichopsis* can be distinguished with certainty from the race of *Otus asio* occupying the same general region by its relatively shorter tail and longer emarginated portion of the inner web of the outer primary, but in the southern part of its range the tail becomes relatively longer. Parallel conditions and variable characters are found in the relationship between other so-called 'species'; for example, the bare base of tarsus of *vermiculatus*, set up to distinguish it from *guatemalae* and the alleged feathered base of tarsus of *guatemalae*. We could cite other cases.

OTUS ASIO CARDONENSIS Huey

Otus asio cardonensis Huey, Auk, 43: 360–362, July, 1926. Canyon San Juan de Dios, about ten miles east of El Rosario, Lower California, Mexico; type in collection San Diego Society of Natural History.

Subspecific characters.—Darker than *Otus asio cineraceus* about head and neck, where the striping is more pronounced; smaller than *cineraceus* and larger than *xantusi;* herring-bone pattern on lower parts more pronounced; markings on legs and feet closer.

Specimens examined.—LOWER CALIFORNIA: El Rosario, 6 ♂, 6 ♀.

Range.—"The giant cactus (*Pachycereus*) association of the Pacific Slope of Lower California in the vicinity of the hills east of Santo Domingo and San Quintin to the region lying east of El Rosario."

OTUS ASIO GILMANI Swarth

Otus asio gilmani Swarth, Univ. California Publ. Zool., 7: no. 1, 1–3, May 26, 1910. Black Water, Pinal Co., Arizona; type in collection Univ. California Museum of Vertebrate Zoology.

Subspecific characters.—Paler and slightly smaller than *O. a. cineraceus;* streaking finer.

Specimens examined.—MEXICO: *Sonora:* Sierra Seri, 1 ♂. UNITED STATES: *Arizona:* Yavapai Co.: Mayer, 1 ♂; Dewey, 1 ♀; Ash Creek, 1 ♂, 1 ♀; Yuma Co.: Ehrenberg, 1 ♂; Maricopa Co.: near Sentinel, 1 ♀; Phoenix, 3 ♂, 1 ♀; Pinal Co.: Oracle, 1 ♂; Pima Co.: Fort Lowell, 10 ♂, 4 ♀, 1 (not sexed), 2 juv.; Tucson, 4 ♂, 5 ♀, 2 juv. *California:* Riverside Co.: Salton, 1 ♀; Imperial Co.: Potholes, 1 ♀; Bard, 1 ♀; San Bernardino Co.: Vidal, 1 ♂, 1 juv. ♂.

Range.—Lower Sonoran Zone of southern Arizona and the Colorado River valley of southeastern California, probably the same zone in extreme northern Sonora and northeastern Lower California.

OTUS ASIO CINERACEUS (Ridgway)

Megascops asio cineraceus Ridgway, Auk, 12: 390, October, 1895. Arizona and parts of northern and central Mexico = Fort Huachuca, Arizona; type in collection U. S. National Museum.

Subspecific characters.—Similar to *O. a. aikeni,* but more delicately penciled, both above and below, the pencilings on under parts averaging denser or more numerous.

Specimens examined.—ARIZONA: Yavapai Co.: Campo Verde, 1 juv. ♂; Montezuma Well, 1 juv. ♀; Cochise Co.: Fairbank, 1 ♂; Portal, 1 ♂, 1 ♀; Fort Huachuca, 2 ♂ (including type); Huachuca Mts., 1 ♂, 1 juv. ♀; Chiricahua Mts., 1 ♂, 1 ♀; Pima Co.: Fort Lowell, 1 ♂, and 1 ♂, 1 ♀, 5 nestlings and juv. in British Museum. NEW MEXICO: Socorro Co.: Reserve, 2 ♂, 2 ♀; Sierra Co.: Elephant Butte, 1 ♀. TEXAS: Brewster Co.: Terlingua, 1 juv. ♀; Valverde Co.: Juno, 1 ♀. (10 ♂ & ♀ in U. S. National Museum.)

Range.—Upper Sonoran Zone from central Arizona east to southern New Mexico and central-western Texas; also in Sonora, Mexico.

Remarks.—Three females from Rio Sestin and Santuario, Durango, were referred provisionally by Miller (Bull. Am. Mus. Nat. Hist., 20: art. 10, p. 164) to *O. asio aikeni.* Although they differ from typical *cineraceus* of Arizona, they resemble in their broader streaking on the upper parts a series in the Bishop Collection from Reserve, New Mexico. They are not at all like *vinaceus* of southwestern Chihuahua and northeastern Sinaloa.

OTUS ASIO MCCALLII (Cassin)

Scops Mccallii Cassin, Illus. Birds California, Texas, etc., pt. 6, p. 180, 1854. Texas and northern Mexico = Lower Rio Grande, Texas; one cotype in collection U. S. National Museum; the other has been lost.

Subspecific characters.—Gray phase much more coarsely mottled above than in any other form of this species; often conspicuously buffy above and below; differs from all other races of *asio* in our field in having a rufous phase which is paler than that of *O. a. asio* with rufous predominating on under parts.

Specimens examined.—UNITED STATES: *Texas:* Uvalde Co., 1 ♂, 1 ♀; Webb Co.: Laredo, 1 ♂, 1 ♀; Nueces Co., 1 ♂, 1 ♀, 1 not sexed; Hildago Co.: Lomita Ranch, 1 ♂; Webbers Ranch, 1 ♀; Hildago, 2 not sexed; Cameron Co.: (no exact locality), 6 ♂, 1 ♀; Brownsville, 15 ♂, 5 ♀, 1 not sexed; Grancano, 1 ♂, 1 ♀. MEXICO: *Tamaulipas:* Rio Martinez, 1 ♂, 1 ♀; Forlon, 1 juv.; *Nuevo Leon:* Rio Salado, 3 ♂; Topo Chico Monterey, 1 ♂ (rufous phase); "MEXICO," 1 without data.

Range.—Extreme southern Texas north to Bexar and Comal County, west to Kinney County and south to Tamaulipas and Nuevo Leon, Mexico.

OTUS ASIO VINACEUS (Brewster)

Megascops vinaceus Brewster, Auk, 5: 88, 1888. Durasno, Chihuahua, Mexico; type in collection of Museum of Comparative Zoology.

Subspecific characters.—Nearest to *cineraceus* and *gilmani*, but mesial streaks narrower above and below; vermiculation more minute; a much greater outcropping of so-called 'pinkish' or 'vinaceous' buff both above and below, but chiefly on throat and rest of under parts.

Specimens examined.—MEXICO: *Chihuahua:* Durasno, 1 ♀ (type); *Sinaloa:* El Orito, 2 ♀ (collection of Robert T. Moore).

Range.—True *vinaceus* is probably found in the Upper Sonoran and lower part of the Transition Zones of the tableland of western Chihuahua, south into the same zones of northeastern Sinaloa.

Remarks.—The type locality, Durasno, cannot be found on maps, but is known to have been located in the mining region of the mountains of central western Chihuahua. A place, spelled "Durazno," is shown on the American Geographical Society's 'millionth' map sheet of Cnihuahua on the extreme western border at about the latitude of Chihuahua City and is doubtless the same place as "Durasno." The color of the map's topographical key indicates the altitude as between 4921 and 6562 feet. In any case "Durasno" can hardly be less than 5000 feet in altitude.

The El Orito specimens represent intergrades with *sinaloensis*, one of them being very close to the type of *vinaceus*. The three constitute the only recorded examples. This race is undoubtedly the rarest Screech Owl in southwestern Chihuahua, while the supposedly rare *Otus trichopsis aspersus* is more common. The senior author, during a two weeks' trip into this region in 1934, heard the characteristic monotone call of the latter frequently and secured three specimens, but only once detected a typical *asio* quaver, which might be assigned to *vinaceus*. This was in the Transition Zone at an altitude of 6300 feet, where pines were the predominating trees.

The buffy 'vinaceous' tone of the Mexican forms of *asio*, noticeable in *mccallii* and *sinaloensis*, as well as to some extent in *xantusi*, reaches its culmination in this race. In their more vinaceous tone, denser but finer vermiculations of abdomen, and darker legs, both *vinaceus* and *sinaloensis* differ far more from *cineraceus* and *gilmani*, than these two latter do from each other.

OTUS ASIO SINALOENSIS Moore

Otus asio sinaloensis Moore, Proc. Biol. Soc. Washington, 50: 64–65, 1937. Guamuchil, northwestern Sinaloa, Mexico, altitude 45 feet; type in collection of Robert T. Moore.

Subspecific characters.—Grayer above and below and distinctly less buffy on throat and upper back than *vinaceus;* light-colored marks on outer webs of exterior row of scapulars much lighter buff; size slightly smaller. Spotting on back much less prominent than in *xantusi;* vermiculations below denser; streaking on abdomen finer.

Specimens examined.—MEXICO: *Sinaloa:* Guamuchil, 1 ♂ (type); *Sonora:* Guirocoba, 1 ♂, 1 ♀.

Range.—Cacti associations of Arid Lower Tropical Zone of coastal northwestern Sinaloa, ranging up the foothills to an altitude of 1450 feet in northern Sinaloa and southeastern Sonora.

Remarks.—The male and female from the Guirocoba Ranch in southeastern Sonora at an altitude of 1450 feet, where the cypress-bordered streams cross the cultivated fields, are intergrades with *vinaceus*, but closer to *sinaloensis*.

OTUS ASIO XANTUSI (Brewster)

Megascops xantusi Brewster, Bull. Mus. Comp. Zool., 41: 93, 1902. Santa Anita, Lower California; type in collection of Museum of Comparative Zoology.

Subspecific characters.—Nearest to *sinaloensis*, and about same small size, but differs in having mesial streaks wider, legs lighter and spots on outer webs of exterior scapulars larger and purer white; *xantusi* is smaller, more finely streaked above and below and lighter in tone than either *gilmani* or *cardonensis*.

Specimens examined.—MEXICO: *Lower California:* Miraflores, 9 ♂, 9 ♀; Laguna Valley, 1 ♂; Santa Anita, 1 ♂ (type); El Sauz, 1 ♂, 2 ♀; Campo Los Angeles, 1 ♀; 4 specimens Coll. U. S. Biological Survey.

Range.—Arid Tropical Zone of Cape district of Lower California, ranging to the tops of the Victoria Mountains.

OTUS TRICHOPSIS

Specific characters.—Toes bristled as in some southern races of *asio*, but feathering at base never so heavy as in extreme examples of *asio*. Differs from *asio* in having bristly tips of feathers of face greatly developed; pale buffy spots on occiput and lower hind neck more distinct; black streaks on upper and under parts relatively much broader; dark spaces on outer webs of primaries seldom mottled with gray; inner web of outermost primary generally unbarred; other primaries only faintly barred, if at all; only one white spot, if any, on base of inner web of outer primary; feet generally smaller.

Remarks.—Although the above characters are well marked in the southern part of the range of *asio* in southwestern Chihuahua and northeastern Sinaloa, in the northern part of the range of *trichopsis* none of these characters invariably holds true for distinguishing individuals. In the mountains of Arizona they serve fairly well, but there are individuals of *asio* in extreme southern Texas, which closely approximate certain individuals of *trichopsis* from western Chihuahua.

Ridgway (Bull. U. S. Nat. Mus., no. 50, pt. 6, p. 704, 1914) gave eight characters for differentiating *Otus trichopsis* from the nearest members of the *asio* group, *O. asio mccallii* and *O. a. cineraceus*. Not one of these characters by itself will invariably distinguish *trichopsis* from what appear to be 'mutations' in the *asio* group. Even the character of the "bristly tips to feathers of the face" is not decisive. In fact, the supposedly minor character of the lack of "distinct whitish spots on the inner web of the outermost primary" is often more conclusive than any other.

OTUS TRICHOPSIS ASPERSUS (Brewster)

Megascops aspersus Brewster, Auk, 5: 87, Jan. 1888. El Carmen, Chihuahua; types in collection of Museum of Comparative Zoology.

Subspecific characters.—Averaging grayer above and below than *trichopsis trichopsis* of southern Mexico; more primaries conspicuously emarginated; generally more deeply incised (see table of measurements on page 48); size slightly smaller in females.

Specimens examined.—ARIZONA: Peña Blanca Spring, 3 ♂; Huachuca Mts., 10 ♂, 3 ♀; Tumacacori Mts., 1 ♂; Chiricahua Mts., 1 ♂, 2 ♀; Santa Catalina Mts., 1 ♂. CHIHUAHUA: San Luis Mts., 1 ♂, 1 ♂ juv., 1 ♀; Sierra Tarahumare, 1 ♂; El Carmen, 1 ♀ (adult cotype), 1 ♀ (juv. cotype); Guayachi (southwestern Chihuahua), 2 ♂, 1 ♀, 2 nestlings. DURANGO: Rio Sestin, 1 ♂. SAN LUIS POTOSI: Alvarez, 1 ♀. NAYARIT: Sierra Madre, 1 juv. not sexed.

Range.—Mountains of southeastern Arizona from at least as far west as Peña Blanca Springs in the Pajarito Mountains, through the Santa Catalina, Huachuca, Chiricahua and San Luis Mountains of the Mexican boundary line, southward through Chihuahua, Durango and San Luis Potosi.

Remarks.—All the adult specimens from Chihuahua, as well as those from Durango, are definitely browner and more ochraceous tawny on the throat than all except four out of twenty-one individuals from Arizona; these four are a female from the Chiricahua Mountains in the collection of Dr. Louis B. Bishop, the male from Peña Blanca Springs in the collection of Dr. Loye H. Miller and two in the British Museum. Without doubt the birds of Arizona average grayer and, as the species is found farther to the south, it gradually becomes browner above and more cinnamon on the throat until the extreme is reached in Honduras. On the other hand in the character of size, the birds in the center of the habitat are the largest, those at the south are smaller, while the Honduras birds are the smallest of all. Birds of Arizona and Chihuahua have as a rule four outer primaries plainly incised

and sometimes a fifth one, those of southern Mexico three plainly and sometimes a fourth, whereas those of Guatemala and Honduras have either two or three. The question of the validity of this race is a problem, but we do not believe it can be solved by sending only two specimens for comparison with those in the British Museum (see van Rossem, Trans. San Diego Soc. Nat. Hist., 7: 184, 1932).

Considering phases, we have an anomalous situation in Arizona and Chihuahua. In the former a great majority of the birds are gray and the rest have the 'brownish' tone exaggerated, because they are July and August individuals, in which the gray edges to the feathers have been worn off. On the other hand in Chihuahua and Durango, all of the specimens, most of them April and May birds, are 'brownish,' the so-called 'intermediate' phase, and neither the gray nor the rufous phase has been recorded. In southern Mexico most specimens have this intermediate coloration, but three are unquestionably in the rufous phase. Van Rossem (op. cit. p. 185) seems to have overlooked two rufous specimens in the American Museum of Natural History from Jalisco and one in the British Museum from Chimalpa, Valley of Mexico (O. S. & F. D. G: 90.5.16.45). We are inclined, on the basis of only slightly incised primaries, to allocate the Jalisco birds to typical *trichopsis*, but these may be intergrades. The juvenile from Nayarit has been placed here provisionally.

The senior author found the nest of this race above a waterfall on a mountain at 6700 feet elevation near Guayachi in extreme southwestern Chihuahua. The nest was in a dwarfed oak, one of the very few remaining in the lower part of the pine belt. It contained both adults and two young nestlings in white downy plumage.

OTUS TRICHOPSIS TRICHOPSIS (Wagler)

Scops trichopsis Wagler, Oken's Isis, 1832, column 276. Mexico; type apparently lost.

Megascops ridgwayi Nelson and Palmer, Auk, 11: 40, Jan. 1894. Patzcuaro, Michoacan; young of rufous phase. Type in U. S. National Museum.

Subspecific characters.—Browner above and below than *O. t. aspersus*, and emarginated primaries fewer, less deeply incised. The material indicates true *trichopsis* as averaging larger in females, but only very slightly larger (wing 143.4 mm.) in males as compared with 142.9 mm. for *aspersus* and 135.8 mm. for Honduras birds; see table of measurements p. 48.

Specimens examined.—SOUTHERN MEXICO: 1 ♂ (cotype of *enano*); Valley of Mexico: Chimalpa, 1 ♂ and 1 ♀ (rufous phase); Ajusco, 1 ♀. *Oaxaca:* 2 not sexed. *Jalisco:* Los Masos, 1 ♂; La Pisagua, 2 (rufous phase without sex). *Michoacan:* Patzcuaro, 1 juv. (type of *Megascops ridgwayi*). *Nayarit:* Tepic, 1 juv. *Guerrero:* Omilteme, 2 ♂, 1 ♀. "Mexico," no data, 1 ad., 2 juv.

Range.—Southern Mexico, probably from Jalisco south to an undetermined latitude, at least to Oaxaca and from the Valley of Mexico to Guerrero.[1]

[1] Since this was written, van Rossem has named *Otus trichopsis guerrerensis* (Condor, 40: 258, 1938, Omilteme, Guerrero, Mexico, 8000 feet). Type in British Museum.

Remarks.—According to Dr. Laubmann, as reported by van Rossem (op. cit. p. 184), the type is "missing." Van Rossem, on the basis of the southern range of the other species described in the same collection, believes that the type locality was somewhere "near the southern end of the Mexican tableland" and this locality we now further restrict to the mountains of the southwestern part of the State of Puebla. If it should later be determined that the name '*trichopsis*' applies to the northern race, we still have to consider *Scops asio*, var. *enano* Ridgway, also from an undetermined locality. The description of '*enano*' has been credited to Ridgway alone, but examination of the original reference (Bull. Essex Inst., 5: 200, Dec. 1873) proves that it had the joint authorship of Baird and Ridgway and was based on two types, one no. 44811 of the American Museum of Natural History marked "*S. asio* var. *enano*, Lawrence. Type," and the other from "Guatemala" formerly in the museum of the Boston Society of Natural History, but now no. 72899 in the Museum of Comparative Zoology. The senior author searched for the former in the American Museum of Natural History and discovered that it possessed no red type-label, but was marked as noted above. There is no doubt whatever that this is the Mexican cotype of *Scops asio* var. *enano* Ridgway.

The two cotypes represent two different subspecies and it is necessary to restrict the application of the name. Theoretically both specimens are of equal rank and the name may be restricted to either one. There are certain practical reasons for fastening the name on to the Mexican cotype. In the first place, it is *the* manuscript holotype of the bird that Lawrence intended to name; in the second place, the Guatemala cotype has been generally overlooked, so that *enano* has for many years been considered as a synonym of *trichopsis;* and thirdly, we cannot really consider ourselves as first revisers, even though we are the first to do so with the evidence of the truly composite nature of *enano* in our possession. The bird was described in 1873. How long before that it was taken, when or by whom, we have no means of knowing, because Lawrence, following the custom of his day, removed the original label, substituting one of his own on which he had indicated that it was a male, from Mexico; the figures '.50' possibly mean that it was collected in 1850 but more probably that it cost fifty cents. We hereby restrict the name *Scops asio* var. *enano* Baird and Ridgway to the Mexican cotype *i.e.*, the larger of the two specimens referred to in the original description.

We have every reason to believe that Lawrence's bird came from Oaxaca. In the first place there is a specimen in Dr. Bishop's collection that matches '*enano*' perfectly; the original label reads "*Scops trycopsis*, Mexico, Oaxaca" and in another hand is added: "Boucard." This bird, after passing through Boucard's hands became a part of the Tweeddale collection, then became the property of the British Museum and finally passed to Dr. Bishop.

There is still another specimen in the British Museum (no. 88.7.20.65) with the following history. The bird bears three labels, one reading "*Scops trycopsis*, Oaxaca, Bouchard"; the second "Ex. Mus. T[homas] C[ampbell] E[yton], 3211, *Scops trycopsis*. Hab. Oaxaca. Date, 1872, author Bouchard [sic]"; the third: "E. Mus. 1881, O. S. and F. D. G.: *Scops trichopsis* Wagler, Oaxaca, Mexico, 1872." This last specimen is of the same make as the bird now owned by Dr. Bishop. The '*enano*' cotype, while not of the same make as the two others, very probably came from the same source at about the same time, *i.e.*, 1872, a year prior to its description and in view of this evidence we restrict the type locality of the larger cotype of *enano* to the State of Oaxaca, Mexico.

OTUS TRICHOPSIS PINOSUS (Nelson and Palmer)

Megascops pinosus Nelson and Palmer, Auk, 11: 39–40, Jan. 1894. Las Vigas, Vera Cruz, eastern Mexico; type in collection of U. S. National Museum.

Specimens examined.—VERA CRUZ: Las Vigas, 1 ♂ juv. (type).

Range.—Unknown. The unique juvenile type came from Las Vigas "at the northeastern base of Cofre de Perote, 8000 feet altitude."

Remarks.—Careful comparison of this type with other juvenile birds of *trichopsis* indicates that it is almost identical in its general pattern and markings with a male juvenile from San Luis Mountains on the boundary line between Chihuahua and southwestern New Mexico, except that it is obviously darker brown both above and below. It has all the earmarks of a *trichopsis*, including small feet, bristled toes, typical juvenile indications of the white spots of collar on hind neck, the inner web of the outermost primary without any whitish spots, and the bristly tips to the feathers of the face greatly developed. Coming from the general area of heavy rainfall and humidity in the Humid Temperate Zone of Vera Cruz, it is logical to expect a differentiated race and to assign this bird tentatively to the *trichopsis* group, a treatment which was forecast by Ridgway (see 'Biologia Centrali-Americana,' Aves, 3: 17, 1897).

While there is not the slightest difficulty in distinguishing between the type of *pinosus* and the juveniles of *aspersus* and *mesamericanus* we are quite unable to say how it differs from the corresponding age and plumage of typical *trichopsis*, since only adults of the latter race are available. The recognition of *pinosus* is only tentative, and must remain so until adults can be secured and the actual differences demonstrated.

OTUS TRICHOPSIS MESAMERICANUS van Rossem

Otus trichopsis mesamericanus van Rossem, Trans. San Diego Soc. Nat. Hist., 7: 184, October 31, 1932. Los Esesmiles, 8000 feet, Chalatenango, El Salvador; type in collection of Donald R. Dickey.

Subspecific characters.—"Dark markings everywhere narrower,—white markings everywhere restricted and coloration very much redder" than in *trichopsis trichopsis* (description quoted from original).

Specimens examined.—GUATEMALA: no locality, 1 not sexed (the Guatemala cotype of *enano* probably from Alto Vera Paz); Chichicastenango, 1 ♂, 1 ♀; Joyabaz, Quiche, 1 ♂; Uspantan-Quiche, 1 juv.; Villa Nueva, 1 ♀; San Lucas, 1 ♀; Chichabac, 2 not sexed; Tecpan, 1 not sexed; "Quatemala," 1 not sexed; Volcan de Fuego above Calderas, 1 ♂; San Bernado, 1 ♂; Dueñas, 1 ♂; Coban, 1 juv. EL SALVADOR: Los Esesmiles, 1 ♂ (type), 1 ♀; Mt. Cacaguatique, 1 ♂; San José del Sacare, 1 ♂.

Range.—Arid Upper Tropical Zone, mountains of Guatemala and El Salvador.

Remarks.—The characters given in the original description regarding the restriction of the dark and light markings do not seem to us to be especially diagnostic, but the much richer coloration of the upper parts appears to be the best distinguishing character. We have not seen sufficient material of the extreme red phase of either *trichopsis* or *mesamericanus* to determine just how the two forms may be differentiated in that plumage. There are two rufous-phase specimens from Guatemala, one in the British Museum from Dueñas with an almost unstreaked uniform back and one in the U. S. National Museum from Villa Nueva with a back moderately streaked, but less markedly than in one from the Valley of Mexico and the two from Jalisco.

Otus trichopsis pumilus subsp. nov.

Type.—Male adult, no. 15582, collection of Robert T. Moore; Cerro Cantoral, Honduras; September 2, 1934, collected by C. F. Underwood.

Subspecific characters.—Smallest of all the races of *trichopsis*, nearest to *Otust. mesamericanus* but much smaller; more vermiculated below, especially on abdomen. Fewer primaries conspicuously emarginated and less deeply incised than in the northern races.

Specimens examined.—HONDURAS: El Derrumbo, 2 ♂; Cerro Cantoral, 1 ♂ (type), 1 ♀; Ilamapa, 1 ♂, 1 ♀; La Flor Archaga, 3 ♂, 2 ♀, 1 juv. ♂, 2 juv. ♀; Monte Redondo, 1 ♀; near Tegucigalpa, 1 ♂, 1 ♀, 1 juv. ♀; El Talangta, 1 ♂.

Range.—Honduras, but exact zone unknown.

Remarks.—In Honduras what appears to be the brown-rufous phase seems more common than the brown. Of seventeen specimens we have seen, twelve are in this so-called 'intermediate' phase and one adult female and three juveniles in the rufous. The seventeenth individual, a December bird in fresh plumage, has the feathers of the back and the wing coverts with vermiculated gray edges, and appears much grayer than it would in summer plumage. The specimens were taken in May, June, July, August, September, October and December and therefore well represent seasonal changes. Our December bird, a fully adult female in fresh plumage, has a wing measurement of 134.2 mm., compared with 142.5 mm. for a winter bird in the Dickey collection from El Salvador and 152.6 and 143.9 mm., respectively, for two winter birds from Guatemala. Obviously it is import-

ant to compare birds of the same color phase and season of the year. Small size alone is sufficiently marked in the new race to distinguish it.

In addition to characters mentioned above, the spotting on the nape averages smaller and browner, giving the backs a more uniform appearance than in *mesamericanus*. The mesial streaks on the lower under parts are narrower.

Average Measurements of Races of Otus trichopsis

	Males		Females		Depth of incision both sexes	Number of primaries plainly incised, both sexes
	Wing	Tail	Wing	Tail		
20 ads. (*aspersus*)	142.9	68.8	4 ads. 142.2	71.3	4.7	4–5
4 ads. (*trichopsis*)	143.4	69.9	4 ads. 148.8	76.7	3.0	3–4
6 ads. from Guatemala (*mesamericanus*)	142.2	70.8	6 ads. 145.1	74.6	3.2	3
3 ads. from El Salvador (*mesamericanus*)	139.8	71.6	1 ad. 141.1	74.8	?	?
9 ads. from Honduras (*pumilus*)	135.8	64.8	6 ads. 135.9	67.0	3.1	1–3

OTUS COOPERI (Ridgway)

Scops cooperi Ridgway, Proc. U. S. Nat. Mus., 1: sig. 8, p. 116, August 15, 1878. Santa Ana, Costa Rica; type in collection of U. S. National Museum.

Specific characters.—Base as well as rest of toes distinctly bristled, differing in this respect from both *O. asio* and *O. guatemalae*, and occupying in this character an intermediate position between the feathered-toed *asio* group and the naked-toed *guatemalae* group. Like *O. g. vermiculatus* it has a short tail, less than half the length of wing. *Cooperi* differs from the *trichopsis* group chiefly in having the bristly tips to feathers of face much less developed, both webs of primaries conspicuously barred, larger size and different color pattern. In this last it closely resembles *O. guatemalae thompsoni*, but differs from the whole *guatemalae* group in having the toes bristled; feet very stout.

Specimens examined.—COSTA RICA: Esparta, 1 ♂, 2 ♀, 1 im. ♀; Santa Ana, 2 ♀ (including type); Rates, 1 not sexed. NICARAGUA: Matagalpa, 5 ♂, 2 ♀; near Tipitapa, 1 ♀; Corinto, 1 ♂.

Range.—Arid Tropical Zone; Costa Rica, Nicaragua, El Salvador and possibly to southern Mexico.

Remarks.—Differing from other commentators, the authors of the 'Biologia Centrali-Americana' compared this species to *guatemalae*. The type specimen has almost the identical coloration of a U. S. Biological Survey individual of *guatemalae thompsoni*, no. 167728 from Chichen-Itza, Yucatan. All of the long series of *cooperi* we have examined, are similar in characters and in tone of coloration, with exception of one unusually gray male from Matagalpa, which is probably immature. The large size of the

feet seems to have been somewhat overstressed, as specimens of *guatemalae guatemalae* have feet just as large.

OTUS GUATEMALAE

Specific characters.—Similar in structure to other American members of the genus, but feathered tarsi contrasting with completely naked toes; markings finer and more blended; upper parts with hastate spots (rather than shaft lines), especially conspicuous on the crown.

OTUS GUATEMALAE HASTATUS (Ridgway)

Megascops hastatus Ridgway, Proc. U. S. Nat. Mus., 10: sig. 17, p. 268, August 1, 1887. La Paz, Lower California = Mazatlan, Sinaloa, Mexico; type in collection of U. S. National Museum.

Subspecific characters.—Uniform in coloration both above and below, like *guatemalae guatemalae*, but much lighter, more 'avellaneous' or 'wood brown'; darker markings of pileum set off more distinctly in the form of irregularly rhomboid or hastate spots. Resembles most closely *O. g. thompsoni* of Yucatan, but averages slightly less buffy brownish above and more densely barred or vermiculated below.

Specimens examined.—SINALOA: "Mazatlan," 2 not sexed (including type); Quelite, 1 (?) (wing feathers and legs only). JALISCO: Mineral San Sebastian, 1 ♂.

Range.—Arid Lower Tropical Zone of Sinaloa; probably the same zone in Nayarit and Jalisco.

Remarks.—Of the four specimens usually assigned to this rare species, only three are true *hastatus*. The individual from "Tepic," mentioned in the 'Biologia Centrali-Americana,' Aves, 3: 23, 1897, is not *hastatus*. The Mineral San Sebastian bird, although suffused with a yellowish-buffy tone, has the characters of *hastatus*. It is certainly markedly different from Chimalpa, Oaxaca, specimens of *guatemalae guatemalae*. The Quelite specimen in the Moore collection was caught in a mouse trap by Chester C. Lamb and all the parts except the legs and wing feathers were destroyed by some mammal; the parts that remain resemble *hastatus*.

We would expect the only two Arid Lower Tropical Zone races of *guatemalae*, i.e., *thompsoni* and *hastatus*, to resemble each other, but the fact they are separated by the whole of Mexico with many divergent climates and different zones intervening, renders their close resemblance extraordinary.

OTUS GUATEMALAE TOMLINI Moore

Otus guatemalae tomlini Moore, Proc. Biol. Soc. Washington, 50: 65–68, April 21, 1937. La Guasimas, Sinaloa, Mexico; type in collection of Robert T. Moore.

Subspecific characters.—Differs markedly from *hastatus*, *thompsoni* and *g. guatemalae* in not having uniform coloration on under and upper parts, the throat and chest being strongly cinnamon buff, while the abdomen is white, distinctly marked by very fine herring-bone streaks; the light brown on lower back contrasting with an indistinct band of light buff across upper back; ground color of whole anterior aspect of face, including forehead, lores, superciliary region and chin very white.

Known only in the brown and duller-rufous phase, the bright rufous unknown.

Specimens examined.—SONORA: Guirocoba, 1 ♀. SINALOA: La Guasimas, 2 ♂ (including type); Los Leones, 1 ♂; Santa Barbara, 1 ♀. DURANGO: Chacala, 1 ♂, 1 ♀ (placed here tentatively). NAYARIT: Tepic, 1 ♀.

Range.—Upper Sonoran Zone of southeastern Sonora to Arid Upper Tropical Zone of mountains of eastern Sinaloa; probably to mountains of Nayarit.

Remarks.—The individual recorded from "Tepic" as "*hastatus*" in 'Biologia Centrali-Americana,' Aves, 3: 23, 1897, was examined in the British Museum, but without the topotypical specimens for comparison. It is markedly different from true *hastatus*, as was noted in the 'Biologia Centrali-Americana' and is certainly close to *tomlini*, but has the darker coloration of the Chacala, Durango, birds. These Chacala specimens are more uniform in coloration than *tomlini* and darker than it or *hastatus*.

OTUS GUATEMALAE GUATEMALAE (Sharpe)

[*Scops brasilianus*] subsp. β. *Scops guatemalae* Sharpe, Cat. Birds Brit. Mus., 2: 112, 1875. Guatemala; type in collection of British Museum.

Megascops marmoratus Nelson, Auk, 14: 49, Mar., 1897. Catemaco, Vera Cruz; type in U. S. National Museum.

Subspecific characters.—Uniform brown coloration above and below, but much darker than *hastatus* or *thompsoni;* much more vermiculated below. Usually both webs of outer primaries are barred, and the bristly tips to feathers of the face are only slightly developed.

Otus guatemalae appears in three phases, ranging on upper parts from 'Verona brown' through 'Rood's brown' to 'Mikado brown' and bright rufous, heavily marked with black hastate spots and streaks above; the rufous phase usually has streaks only.

Specimens examined.—GUATEMALA: Secanquin, 1 ♀. PETEN: Chuntunqui, 1 ♂; Laguna Perdida, 1 ♀; La Libertad, 1 ♂. ALTA VERA PAZ: Finca Tres Aguas, 1 ♀; Vera Paz, 3 not sexed; 13 without data (including type). MEXICO: *Oaxaca:* Chimalpa, Tehuantepec, 1 ♀, 1 not sexed. *Vera Cruz:* Catemaco, 1 ♀ (type of *marmoratus*). HONDURAS: Subirana, 1 ♀; Cerro Pucca, 1 ♀.

Range.—Southern Vera Cruz and southeastern Oaxaca to Subtropical Zone of Guatemala and Honduras.

Remarks.—The senior author in August 1938, examined the type of *Scops guatemalae* and the large series of this race in the British Museum. Plate 9, vol. 2, 'Catalogue of Birds in British Museum,' shows two Screech Owls, a brown and a rufous phase, the former obviously intended to represent the type of *guatemalae*, since the type specimen has on its label in Sharpe's handwriting the word "Figured," which also is written in the same handwriting on the label of the rufous-phase specimen (no. 75.6.14.37). The rufous-phase illustration represents excellently the rufous-phase specimen, but the brown-phase illustration is very different from the type. It portrays a distinct black facial rim, contrasting sharply with an ochraceous-buff facial disk, and a yellowish-ochraceous tone over the entire bird, neither of which is possessed by the type. Not a single one of the nineteen specimens in the British Museum bears any resemblance to this illustration! On the other

hand, Sharpe's unusually detailed description is a quite accurate portrayal of the type. There is no mention of the yellowish-ochraceous coloration of the illustration, and, although the ear coverts are stated to be "*broadly* tipped with black" (an inaccuracy), this clause is correctly conditioned by the phrase "*merging* in the ruff" (italics ours). It merges completely!

Contrary to the effect of this illustration, the *absence* of a conspicuous black facial rim is a distinguishing character of true *guatemalae*, and is entirely absent in most specimens or reduced to a vestige, as in this type. Furthermore, the upper parts of the type and a large portion of its under parts, although obscurely barred and vermiculated, give the general appearance of a uniform dark-brown color above, quite different from the illustration. There are some specimens in all phases which reveal the white ground color of the lower under parts more prominently than does the type.

The female from Subirana, Honduras, has all the characters of *guatemalae*, including prominent bars on both webs of all the primaries and the general dark, heavily vermiculated uniform coloration of *guatemalae*, but the bristled tips to the facial feathers are well developed.

The type of *Megascops marmoratus* Nelson from Vera Cruz, is true *guatemalae*.

OTUS GUATEMALAE CASSINI (Ridgway)

Scops brasilianus cassini Ridgway, Proc. U. S. Nat. Mus., 1: sig. 7, pp. 90 and 102, August 15, 1879. Mirador, Vera Cruz, eastern Mexico; type in the collection of the U. S. National Museum.

Subspecific characters.—Differs from *guatemalae guatemalae* in much darker brown (less rusty) coloration; the upper parts not uniform, having two transverse bands of dull-buff spots on hind neck and upper back; bristly tips to feathers of face longer; inner webs of primaries unbarred; facial rim more prominent; size much smaller. It occurs in both the brown and the rufous phase.

Specimens examined.—MEXICO: *Vera Cruz:* Mirador, 1 (cotype, not sexed, in brown phase), 1 ♀; Jalapa, 1 (cotype, not sexed, in rufous phase, M. C. Z. 12372), 1 (rufous phase in British Museum).

Range.—Known only from the humid northeastern slopes of Mt. Orizaba, Vera Cruz (Mirador, Jalapa).

Remarks.—Apparently only four or five specimens are known of this rare race. "Jalapa," the name given on a tag of the British Museum specimen, has, according to Chapman (Bull. Amer. Mus. Nat. Hist., 10: 18, 1898), an altitude of 4400 feet and is "in the heart of the Temperate Zone." Chapman calls attention to the fact that a two-hours' walk from Jalapa, either up or down the mountain, would bring the collector into an entirely different zone. All the specimens known were taken many years ago, when collectors were notoriously careless in marking specific localities. The brown-phase cotype (U. S. Nat. Mus., no. 27115) and a female (U. S. Nat. Mus., no. 33556) have marked on their tags "Mirador," which is located at a higher

altitude than Jalapa. Therefore, it seems probable that this species is a so-called 'Temperate' Zone representative, although it may extend its range into a lower zone.

Salvin and Godman (Biologia Centrali-Americana, Aves, 3: 22, 1897) believed specimen no. 33556, mentioned above, to be a cotype, when Ridgway forwarded it for examination.

The race *cassini* has many of the characters of the *trichopsis* group, namely, well-developed bristly tips of facial area; inner webs of outermost primary uniform in color, without bars or distinct whitish spots (except sometimes one near base); facial rim plainly outlined with dark color and throat buffy, but the toes are completely naked.

The rufous-phase specimen in the British Museum has only very faint indications of black streaking on the back and is paler than any of the rufous-phase individuals of *guatemalae guatemalae*.

Otus guatemalae fuscus subsp. nov.

Type.—Male adult, no. 10,272, collection of Robert T. Moore; Motzorongo, Vera Cruz, Mexico; September 1932, collected by Mario del Toro Avilés.

Subspecific characters.—Nearest to *Otus guatemalae cassini*, but size much larger; darker above; more heavily vermiculated below; throat less buffy, grayer.

Measurements.—Male: wing, 160.8 mm.; tail, 81.6. Female: wing, 163.7; tail, 81.0. The wings and tail of the type are badly worn.

Specimens examined.—MEXICO: *Vera Cruz:* Motzorongo, 1 ♂ (type), 1 ♀.

Range.—The two known specimens come from the Humid Tropical Zone near the southern base of Mt. Orizaba.

Major E. A. Goldman, in a letter to the senior author, states that Motzorongo was one of his collecting localities and is an "hacienda about 25 miles southeast of Cordova, on the Mexican Railroad. It is situated in the humid tropical lowlands, at about 800 feet altitude, near the eastern base of the mountain."

Remarks.—This is the Humid Tropical Zone representative of the 'Temperate' Zone *cassini*. Its very dark coloration alone, nearly fuscous on pileum, would distinguish it from any member of the *guatemalae* group. On account of its dense vermiculation below, it bears a superficial resemblance to *guatemalae guatemalae*, but differs in the characters given above. It is a very different bird from the type of *Megascops marmoratus* Nelson of the sparsely wooded country about Lake Catemaco, Vera Cruz; this bird is a typical *guatemalae* with outer primaries conspicuously barred, much lighter snuff color throughout and of larger size. The toes of *fuscus* are completely naked as in all races of *guatemalae*. Only the brown phase is known.

OTUS GUATEMALAE THOMPSONI Cole

Otus choliba thompsoni Cole, Bull. Mus. Comp. Zool., 50: 123, November 1906. Chichen-Itza, Yucatan; type in collection of Museum of Comparative Zoology.

Subspecific characters.—Uniform in coloration like *hastatus*, but averaging slightly more buffy brownish above and less densely barred or vermiculated beneath; slightly larger. Much paler in coloration than *cassini* or *fuscus*.

Specimens examined.—YUCATAN: Chichen-Itza, 1 ♂, 1 ♀ (cotypes), 2 ♀; Tizimin, 1 ♂. CAMPECHE: Tuxpeña, Champoten, 1 ♂, 1 ♀ (intergrades).

Remarks.—This is an Arid Lower Tropical Zone form and is much closer to the tropical *hastatus* of Sinaloa than to the zonal forms geographically nearer, or to those of the region between, such as *tomlini*. The male specimen from Campeche differs from typical *thompsoni* in having wider dark streaks below and darker coloration above. Both of these Campeche birds are intergrades between *thompsoni* and *guatemalae*. *Thompsoni* has the dull whitish hoariness on the forehead like true *hastatus*, not so pure white as in *tomlini*.

Otus guatemalae dacrysistactus[1] subsp. nov.

Type.—Male adult, no. 103,292, collection of American Museum of Natural History; Jalapa, northern Nicaragua, January 20, 1909; collected by W. B. Richardson.

Subspecific characters.—About as dark as *fuscus*, but much less vermiculated below and having much larger areas of ground color pure white, resembling in this respect *tomlini*. Spotting of upper back is more cinnamon than in *fuscus* and the two neck bands are less distinct. The type resembles the type of *cassini*, but is more cinnamon buffy above, and size is much larger. It has the posterior under parts much whiter than in any specimen of true *guatemalae*, and the bristly tips of face more prominent. Inner webs of outer primaries are unbarred in our specimens.

Specimens examined.—NICARAGUA: Jalapa, 1 ♂ (type), 1 ♂ (probably ♀), 1 ♀. HONDURAS: Catacombas, 1 ♂ (intergrade).

Range.—Known only from the Subtropical cloud forest of northern Nicaragua.

Measurements.—Male: wing, 153.3 mm.; tail, 78.2. Female: wing, 165.6; tail, 82.3.

Remarks.—The three Jalapa birds are in the gray phase. The male from Catacombas seems to be an intergrade in the intermediate phase, having the unbarred inner webs of outer primaries and long bristly tips to facial feathers of *dacrysistactus*, but in coloration is closer to true *guatemalae*.

OTUS GUATEMALAE VERMICULATUS (Ridgway)

Megascops vermiculatus Ridgway, Proc. U. S. Nat. Mus., 10: sig. 17, p. 267, August 1, 1887. Costa Rica; type in the collection of the U. S. National Museum.

Subspecific characters.—Differs from *guatemalae guatemalae* in usually having the lower third of the tarsus bare; tail proportionately shorter, less than one-half the length of the wing, whereas in *guatemalae* it is more. Although exhibiting considerable variation, specimens average more uniformly vermiculated below and the whitish superciliary streak tends to become more obscure.

Specimens examined.—COSTA RICA: 2 specimens without data (including type); La Candelaria, 1 ♂. PANAMA: Boquete, Chiriqui, 1 ♂; Cana, 2 ♀; 1, "Tayaba, Quiche, Guatemala" = Panama, according to Ridgway; Calovevora, Veragua, 2 ♂;

[1] From the Greek adjective δακρυσίστακτος = 'dropping with tears,' referring to the tear-like spots on under parts.

Chitra, 1 ♂; "Panama," 1 not sexed; "Chiriqui," 1 not sexed; "Veragua," 5 not sexed.

Range.—Costa Rica to Panama and possibly farther south.

Remarks.—Both brown and rufous phases are common.

OTUS CHOLIBA

Specific characters.—Agreeing in size and proportions with *O. asio*, but toes completely bare; pattern of markings closely paralleling that of *O. asio*. Distinguishable from the northern forms of *guatemalae* by much less vermiculated appearance and from the southern forms of *guatemalae* by having the tarsi feathered to the base of the toes.

OTUS CHOLIBA LUCTISONUS Bangs and Penard

Otus choliba luctisonus Bangs and Penard, Proc. Biol. Soc. Washington, 34: 89, 1921. Escazu, Costa Rica.

Subspecific characters.—Similar to the South American races of *O. choliba*, but the dark markings of the centers of the feathers, especially on the under parts, much finer. Apparently known only in the brown and rufous-brown phases.

Specimens examined.—COSTA RICA: Escazu, 1 ♂ (type); San Juan, 1 ♂; San José, 1 juv.; no exact locality, 1 ♀, 2 adults not sexed. PANAMA: Divala, 1 ♂; Chitra, 1 ♂. PEARL ISLANDS: San Miguel Island, 5 ♂, 2 ♀.

Range.—Costa Rica, Pacific slope of western Panama to the Canal Zone, Pearl Islands, northwestern Colombia.

Remarks.—Since it is not the purpose of this paper to attempt a revision of the South American forms of the genus *Otus*, we will not diagnose the six additional currently recognized races of *O. choliba* found on that continent, but we do wish to take this opportunity to point out that all of the other forms exhibit a much greater range of color variation than does *luctisonus*. True *choliba* and *c. decussatus* occur in both the extreme rufous and the extreme gray phases as well as in various intermediate steps of brown; *crucigerus* shows a greater range of brown without quite reaching the rufous and gray extremes. We have not seen enough material of *margaritae*, *duidae* and *wetmorei* to make any more definite statement than that the first is found in both brown and extreme-rufous phases.

OTUS BARBARUS (Sclater and Salvin)

Scops barbarus Sclater and Salvin, Proc. Zool. Soc. London, 1868, p. 56. Santa Barbara, Vera Paz, Guatemala; type in the collection of Salvin and Godman, now in the British Museum.

Specific characters.—A distinct species having the highly developed bristly tips of *trichopsis*, the bare toes of *guatemalae*, and the bare lower tarsus of *vermiculatus;* but differentiated by extensive white spotting over all under parts and anterior portion of upper parts; size small.

Specimens examined.—GUATEMALA: between Coban and Chisec, 1 not sexed; Uspantan Quiche, 1 ♀; Vera Paz, 1 not sexed (type brown phase); Santa Barbara, 1 not sexed (marked "Type," rufous phase); "Guatemala," 1 no data.

Range.—Subtropical and Humid Zones in mountains of northern Guatemala.

Remarks.—Three specimens of this rare owl, one without data, were examined in the British Museum. Of the two other specimens, both from the Salvin-Godman collection, one is in the rufous, the other in the brown phase. Both bear several labels including one plain red one and one white, each bearing the word "Type." On reading the original description it is quite clear that Sclater and Salvin distinctly referred to the brown specimen as *the* type, only alluding incidentally to the other example as "a rufous variety of the same species." The primaries are only faintly incised as in most specimens of *Otus trichopsis pumilus*. The pattern of the coloration on the primaries and especially the uniform inner web of the outer primary, as well as the spotting on the nape, are as in the *trichopsis* group. In fact, the immature of *trichopsis*, particularly *pinosus*, bears a striking resemblance to *barbarus*, except for its bristled toes. The adults are distinctly different. The red phase is heavily streaked with black on upper parts.

OTUS CLARKII Kelso and Kelso

? *Bubo nudipes* Vieillot, Ois. Amer. Sept., 1: 53, pl. 22, 1807. Greater Antilles.[1]

Otus clarkii Leon and Estelle H. Kelso, Biological Leaflet, no. 5, Supplement to Key to Spec. Amer. Owls, November 8, 1935. Calobre, Panama.

Specific characters.—A very distinct species differentiated by bare toes and completely naked lower third of tarsus; bristly tips to feathers of the face greatly developed; inner webs of primaries unbarred; the seventh, sixth and fifth primaries longest; unusually large size and great predominance of black and cinnamon in general coloration.

Specimens examined.—COSTA RICA: Irazu, 1 not sexed; Volcan de Turrialba, 1 ♂; Zarcero, 1 ♀; Azahar de Cartago, 1 ♂; San Pedro Mojon, 1 ♂; no locality, 1 ♂, 5 (not sexed); Veragua, Calobre, 1 not sexed.

Range.—Temperate Zone, Costa Rica and Panama.

OTUS FLAMMEOLUS FLAMMEOLUS (Kaup)

Scops (*Megascops*) *flammeola* "Licht.," Kaup, Jardine's Contr. Orn. for 1852, p. 111, 1853. Mexico; type in the collection of Berlin Museum. Type locality designated by Griscom as "Valley of Mexico."

Specific characters.—Smallest American species of the genus, differentiated by having outermost primary longer than the secondaries; feet small; toes naked; ear-tufts short (almost rudimentary) and iris brown as compared with the yellow of the other bare-toed species.

Specimens examined.—CALIFORNIA: Sequoia National Park, 1 ♂; Mt. Pinos, 1 ♂; San Bernadino Mts., 1 ♂. ARIZONA: Crook National Forest, 1 ♂, 1 ♀, 2 nestlings; Huachuca Mts., 2 ♂. COLORADO: Beulah, 1 ♂, 1 ♀. MEXICO: Chimalpa, 1 ♂; Coapa, 1 ♀; Valley of Mexico, 2 not sexed; "Mexico," 1 not sexed; "W. Mexico," 1 not sexed.

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[1] The bird which for many years had been known as *Otus nudipes* (Vieillot) was renamed by Mr. and Mrs. Kelso on the ground that neither the text nor the plate of the original description applied to the species for which it was used. We are quite in agreement with this.

Range.—Transition to Temperate and Hudsonian Zones, from southern British Columbia southward through the mountains of the western United States to the Temperate Zone of Mexico.

Remarks.—Ridgway has pointed out that this species is subject to a great amount of individual variation, having an extreme grayish phase without trace of cinnamon. Most of the specimens from the western United States are strongly cinnamoneous.

OTUS FLAMMEOLUS RARUS Griscom

Otus flammeolus guatemalae Griscom, Ibis, (13) 5: 549, 1935. Dueñas, Guatemala; type in collection of British Museum. Not *Otus guatemalae* (Sharpe), 1875.

Otus flammeolus rarus Griscom, Auk, 54: 391, 1937. New name for the foregoing.

Subspecific characters.—"Similar to typical *flammeolus* (Kaup) of Mexico, but in the intermediate phase more brownish, less purely gray in ground-color above; ochreous longitudinal wing-bars richer and deeper; broken collar across hind neck tawnier and brighter, less brownish; most of the occiput bright tawny ochraceous rather than rusty brown; chestnut areas on side of head and auricular region paler, brighter and more richly colored; brownish or rusty washing on underparts brighter and tawnier" (Griscom).

Specimens examined.—GUATEMALA: Dueñas, 1 not sexed (type), 1 not sexed.

Range.—Highlands of Guatemala.

Remarks.—The characters given by Griscom are shown in the two specimens in the British Museum. Both are almost identical in coloration. Four specimens from the Valley of Mexico, the type locality of *flammeolus flammeolus*, in the same museum vary considerably. The two gray-phase individuals, with some cinnamon markings, and the one rufous phase are very different from *rarus*. The fourth bird resembles *rarus* closely, but shows a greater extension of cinnamon markings above and below.

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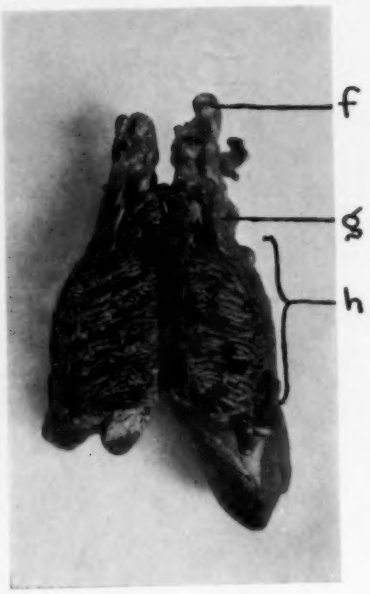

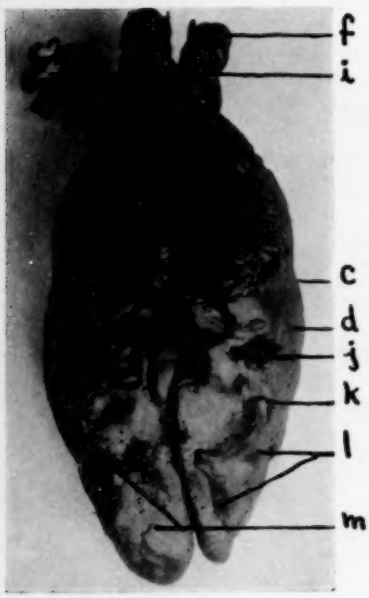

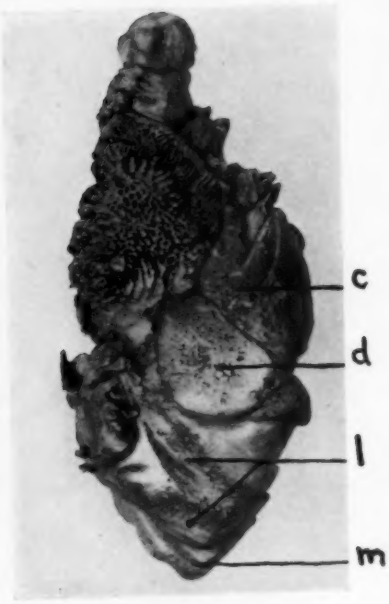

CASTS OF AIR-SAC SYSTEM OF THE PIGEON

UNIV. OF MICH.

THE AVIAN LUNG AND AIR-SAC SYSTEM

BY PERRY W. GILBERT

Plate 4

IN the following pages the author has attempted to review briefly the main contributions pertinent to an understanding of the avian lung and air-sac system. Supplementing this review is a description of a method for casting the system using Woods Alloy. Casts were made of the lungs and air sacs of the Domesticated Pigeon (*Columba livia*). This bird was chosen because considerable work had already been done on its respiratory system.

I am indebted to the Department of Zoology at Dartmouth College for furnishing me the necessary equipment with which to pursue the experimental aspect of this problem. I also wish to thank Dr. N. K. Arnold and Dr. W. W. Ballard for their encouraging enthusiasm and assistance.

HISTORICAL

For over two and one-half centuries it has been known that there are certain structures accessory to the bird's lung—the air sacs. Harvey (1651) was the first to describe them carefully. For the next century and a half investigators speculated widely as to the function of the sacs but it was not until 1828 that any marked scientific information was obtained concerning them. From this time on, we find the investigators falling into four main groups—embryological, histological, morphological and physiological.

As to the embryological observations, the earliest contribution is by Rathke (1828) in which we find the first figures of the buds of ecto- and entobronchi. Selenka (1866) wrote concerning the development of the air sacs and His, two years later, on the laryngo-tracheal groove and trachea. Zumstein in 1900 explained the nature of the bronchial tree and the air sacs. The sacs and their method of growth were further described by Moser (1902). Juillet (1911) published a comprehensive treatise embracing the anatomical, embryological, histological, and comparative study of the bird's lung. He emphasized the important fact that the branches of the bronchi in the lung never end in 'cul-de-sacs,' but are all in intercommunication, forming circuits which can be traversed by pure air, from one end or the other, according to whether the air comes from the air sacs or the trachea. Thus the lung consists of a labyrinth of air-containing branches interpenetrated by a labyrinth of blood capillaries, each of which is surrounded on all sides by air. The latest investigations of an embryological nature were carried out by William Locy and Olof Larsell (1916). These investigators have attached much importance to the 'recurrent bronchi,' recognized by Schulze and Juillet, which spring from the air sacs and grow

back into the lungs where they establish numerous connections with the bronchial branches. We will have occasion to refer to the work of these men later.

The main histological contributions have been advanced by F. E. Schulze (1871); M. J. Ross (1899); and Oppel (1905).

Campana (1875) was the first to make a careful analysis of the anatomy of the bronchial passages. His investigations brought to light the bronchial circuits which unite the various divisions of the bronchi into a plexus of intercommunicating passages. He also noticed recurrent bronchi without understanding their significance. Huxley (1882) brought the terms mesobronchium, ecto-, ento-, and parabronchi into common use. The air sacs in the adult bird have been further described by Bruno Müller (1908) who worked on the pigeon. In his treatise 'On the Air Sacs of the Pigeon' he gives a most detailed and careful description of the sacs themselves without involving the anatomy of the lungs. Some of his methods and results obtained will be referred to below. F. E. Schulze (1911) published an excellent paper on the comparative anatomy of the air sacs in the adult. Here, for the first time, the recurrent bronchi were fully described and their physiological office was pointed out. The most recent observations on the morphology of the bird's lung are contained in the paper of Juillet mentioned above. Here also may be found a review of previous work done on the avian lung and air sacs.

Little work has been done thus far pertaining to the physiology of the air sacs. Campana's paper on the 'Physiology and Respiration of Birds' is of chief importance anatomically. Since the time of Harvey the function of the air sacs has proved fertile soil for speculation. The following functions have been attributed to them: aid in raising feathers; act as resonatory organs; lessen specific gravity of bird; regulate the body temperature; fix wings in a distended position; have a function analogous to that of a swim bladder; have a respiratory function. Müller (1908) rejected all these ideas and made the following statement: "I do not consider the air sacs, including the air cavities of bones, as organs having a positive and special function, but rather as a system of empty interspaces. Their value lies in their emptiness—that is, in their containing nothing that offers resistance or has appreciable weight."

Present Status of Avian Lung and Air-Sac System

It is through the careful investigations of Schulze (1911), Juillet (1911), and Locy and Larsell (1916) that we arrive finally at our present conception of the avian lung and accessory air sacs. Breathing in birds is specialized in relation to flight, to song, and to intense activity in general. The lungs, though relatively small and hardly distensible, have a large internal surface

for gaseous exchange. The driving out of air is assisted by strokes of the wings. Expiration is the active part of the respiratory process, not inspiration as in mammals.

Just posterior to the tongue is the glottis, the opening into the trachea. The upper part of the trachea is known as the larynx, which, unlike that of mammals, possesses no vocal cords. It is supported by cartilages which are transformed representatives of the branchial arches. The trachea is supported by bony rings which usually form a complete circuit around the wind pipe. It is moved by two sternotracheal muscles attached to the anterior part of the sternum. The base of the trachea is enlarged to form the syrinx or voice-box, an organ found in most birds though absent in ostriches, storks and some vultures. The three upper rings of the two bronchial tubes also aid in the formation of the syrinx. The short bronchi divide in a unique fashion to form the lung. A main stem passes right through as the mesobronchus and leads into the abdominal air sac. The greater part of the mesobronchus appears to be dilated. From this enlarged portion secondary bronchi arise, some of which lead directly into the air sacs, while others merge into the highly branched parabronchi (tertiary bronchi) supplying the lung. These parabronchi are continuous, thus forming a network of air capillaries—the bronchial circuit. Budding off from the air sacs are the 'recurrent bronchi' which lead into the lung parenchyma and merge with various parabronchial air capillaries. "By means of the recurrent bronchi and their anastomoses with other branches of the bronchial circuits the air-sacs are brought into communication with all parts of the lung. They have direct communication with bronchus and central lung tube through their 'direct orifices' and a recurrent communication through the recurrent bronchi" (Locy and Larsell, 1916, part 2, p. 21). Thus the air sacs are not to be thought of altogether, at least, as terminal sacs; "they may be regarded as expanded reservoirs on the course of the bronchial circuits" (Thomson, 1923, p. 129).

It is now generally accepted that there are nine sacs accessory to the avian lung. Four paired sacs and one single sac can be distinguished as follows:

(1) Cervical sacs (paired)—in region of the nape of the neck.

(2) Interclavicular sac (single)—adherent to syrinx and situated ventrally, laterally, and proximally to it. Numerous diverticula arise from this sac including the subscapulare, axillare, suprahumerale, and sternale.

(3) Anterior intermediate sacs (paired)—separated from lung by pulmonary diaphragm.

(4) Posterior intermediate sacs (paired)—asymmetrical, left sac reaching farther posteriorly and larger than right. Left sac extends beyond last rib into abdominal cavity. Right sac extends but little or not at all beyond last rib.

(5) Abdominal sacs (paired)—largest of all sacs; enter abdominal cavity dorsally and partially enclose viscera; have several accessory diverticula. One may find further detail as to the relative size and location of the sacs in Müller's (1908) treatise on the 'Air Sacs of the Pigeon.'

The sacs appear as thin transparent membranes, with more or less of a fibrous connective-tissue basement. All the sacs, with the exception of the interclavicular, can be freed of connections with adjacent tissues. The sacs are lined with pavement epithelium. Where the sac is attached to surrounding tissue the lining cells become columnar. Cilia are present over the entire surface of the sacs contained within the body cavity. They are absent, however, in the prolongations of the sacs into the joints and in the cavities of the bones. The function of the cilia is not definitely known but is believed to be that of removing exfoliated epithelium and foreign substances from the sacs. Brief histological reviews of the air-sac system have been set forth by M. J. Ross (1899) and by Oppel (1905).

The excellent treatise on 'The Embryology of the Bird's Lung' by W. A. Locy and Olof Larsell (1916) has shed much light upon the development of the avian lung and air-sac system. They succeeded in tracing the development of the lung and air-sac system in the chick embryo from the time the egg was laid up through time of hatching. The following are some of their interesting observations. The lung became definable near the close of the third day of incubation. The abdominal and cervical sacs were the first to appear at the end of the seventh day. These were followed shortly by the anterior and posterior intermediates, the interclavicular being the last to appear. At the end of the ninth day all sacs had projected beyond the periphery of the lung. The recurrent bronchi made their first appearance after ten and one-half days of incubation. All the sacs except the cervical possessed these recurrent branches.

As to the present conceptions concerning the functions of the sacs, much may be said. Locy and Larsell state: "The lung of birds is not large in extent, but it is highly vascular and the continuous air current from the air sacs through the recurrent bronchi makes it an effective apparatus for aëration of the blood." The air sacs are also believed to promote internal perspiration, thus aiding in regulating the high temperature of the avian body. "Most birds take much water, but there is little water in their urine, which is semi-solid, and they have no sweat glands like mammals. Hence, the advantage of the internal surfaces of the air sacs, for water-vapour diffuses from the blood into the cavities and passes out by the lungs" (Thomson, 1923, p. 128). Thus the theory of Müller that the air sacs have no definite function but are valuable because of their emptiness, tends to overemphasize one aspect.

METHOD FOR CASTING

Since the author was especially interested in the relative positions of the sacs and their accessory diverticula, the most satisfactory approach to the problem was by means of casts. Several types of injection masses were considered including Fol's metagelatin vehicle, celloidin, gelatin, paraffine, Woods Alloy and Darcet's metal. Finally it was resolved to use Woods Alloy. This fusible alloy is made up of bismuth, lead, tin and cadmium, has a specific gravity of 9.5 and a melting point at 70° C.

Rather than go through the long formalin-hardening process of Müller and injecting individual sacs, it was decided to inject directly into the trachea of a pigeon freshly killed with ether. About 600 grams of Woods Alloy were melted in a beaker placed in boiling water. The melted metal was then transferred into the chamber of the syringe which was heated further. Simultaneously the pigeon was heated a few minutes in a water bath at a temperature of approximately 65° C. The bird was then removed from the water bath and the trachea quickly exposed and slit for the reception of the syringe canula. The posterior end of each abdominal sac was punctured so that air in the lungs and sacs might escape and be replaced by Woods Alloy. The injection time lasted forty-five seconds. During this process the bird was held with the left hand while the syringe was manipulated with the right. A glove was used to insulate the right hand. The Woods Alloy remained fluid approximately a minute and a half. This gave time to massage and turn the bird in various positions so that the metal might be uniformly distributed throughout the system. The metal was allowed to set for half an hour before the casts were dissected out. In the case of the lung and smaller diverticula where dissection was difficult, artificial gastric juice proved a useful agent in digesting away neighboring tissue.

The anterior and posterior intermediate sacs cast well consistently. To obtain the remaining sacs it was necessary to place the bird in various positions while injecting the metal and then to hold the bird head downward, closing the trachea to prevent back flow. The cast of the interclavicular sac and diverticulum sternale was obtained by allowing the bird to rest on its ventral surface. The best lung detail was obtained when the bird rested on its dorsal surface. The abdominal sacs were the most difficult to cast. This was probably due to the fact that they were farthest from the point of injection and the metal began to cool before reaching their orifices from the mesobronchi. Thus it was necessary to place the posterior and middle portions of the bird in a hot bath and inject while the long axis of the bird was vertical. The subscapulare, axillare, and suprahumerale diverticula were obtained by puncturing the pneumatized humerus.

DISCUSSION

The casts obtained agree rather closely with those of Müller (1908) who used wax as an injection mass. The advantage of Woods Alloy over wax lies in the fact that the former is more permanent and less likely to be secondarily distorted. By injecting directly into a warm, freshly killed bird the long formalin-hardening process of Müller and the alcohol-distension process of Locy and Larsell are eliminated. Because of the pressure with which the metal was forced into the sacs, the complete casts obtained probably represent the sacs at their maximum distension. By regulating the amount of metal injected and the position of the bird during the injection it is possible to cast only a desired part of the system (see Plate 4). Duplicate and unsatisfactory casts may be melted and the metal injected into another bird. Casts of the lung and air sacs have proved useful as teaching demonstrations and it is hoped will be of service in making a comparative morphological study of this remarkable avian system.

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DESCRIPTION OF PLATE 4

Upper left: Ventral view of partial cast, approximately two-thirds natural size. Note: trachea (*a*); single interclavicular sac (*b*); left anterior intermediate sac (*c*); left posterior intermediate sac (*d*) with accessory diverticulum (*e*).

Upper right: Dorsal view of partial cast, approximately two-thirds natural size. Note: right cervical sac (*f*); right subscapular diverticulum (*g*); right lung (*h*).

Lower left: Dorsal view of nearly complete cast, approximately two-thirds natural size. Note: right cervical sac (*f*); left suprahumeral diverticulum (*i*); right anterior intermediate sac (*c*); right posterior intermediate sac (*d*); right anterior femoral diverticulum (*j*); right posterior femoral diverticulum (*k*); right and left abdominal sacs (*l* and *m*). Observe asymmetry of abdominal sacs.

Lower right: Right lateral view of same cast, approximately two-thirds natural size. Note: right anterior intermediate sac (*c*); right posterior intermediate sac (*d*); right abdominal sac (*l*); left abdominal sac (*m*).

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LEG COLOR IN ROYAL TERNS[1]

BY EDWARD B. CHAMBERLAIN

THOSE engaged in banding young terns cannot fail to notice the many color variations present in the legs and feet of these birds. Before discussing this matter, however, a few words about the banding method evolved may be of interest. In handling young terns and other birds of similar habits and habitats, we have found the safest and most effective method to be the use of a low circular fence of chicken wire. Wings extend from this corral, and the young birds, usually found wandering about the breeding grounds in bands of varying size, are carefully rounded up and slowly driven into the funnel-shaped opening of the corral. The birds to be banded are the young ones just starting to fly, or within a week or less of flight age, and measure about fifteen inches in total length. Birds younger than these are 'cut out' of the group being driven into the banding corral, in order to eliminate danger of injury or loss from overcrowding, often fatal to downy young. When the birds have been driven in, the wings of the corral are closed. Further safety is insured by the use of pockets in the corral fence. Into these pockets are driven about two dozen birds at a time. The remainder of the corralled young are kept slowly moving in the center of the pen, away from the enclosing wire. An operator places himself in front of each pocket, bands the birds within it, and drops them over the low fence, whence they go back to the main colony. In this manner we have banded as many as three thousand young at a time without a single fatality.

In June 1937, members of The Charleston Museum staff cooperated with the U. S. Bureau of Biological Survey in banding about two thousand young Royal Terns (*Thalasseus maximus*) at the Cape Romain Refuge, in Charleston County, South Carolina. In order to determine the amount of color variation present in the legs and feet of birds of banding age, each bird was examined while being banded and notes were made of the colors found.

In this study, 1940 young Royal Terns were handled. Of these, 1563 (80%), proved to have legs and feet of an immaculate or 'solid' color. The remaining 377 birds (20%) had mottled legs and feet. Taking up the first and more numerous group, we found solid colors present in the following order: slate to black, orange, and flesh color. The slate to black group (hereafter called black) consisted of 926 birds, 59% of the solids and 48% of entire lot of birds examined. This means that, at flying age, almost half of

[1] Presented before the Fifty-fifth Meeting of the American Ornithologists' Union, at Charleston, South Carolina, November 1937.

these young birds had attained leg and foot coloration closely approximating that of the adults. The next color, orange (and its variants), accounted for 408 birds, 26% of the 'solids' and 20% of the whole. The third 'solid' color, flesh, was found in 229 birds, 15% of the 'solids' and 12% of the entire number.

Occasionally a bird classed as 'solid' in one of the three colors would show a small amount of another of these colors. For example, certain black-legged birds showed a narrow band or garter of orange or flesh around the 'legs' at the edges of the feather tract. One got the impression that here the black had gradually crept upward, finally gaining complete ascendency. Furthermore, some birds showed what might be considered the genesis of the foregoing condition. In these birds were found orange or flesh-colored legs with a concentration of black pigment along the front edges of the tarsi. Again, an occasional orange- or flesh-legged bird would have a fine, fairly even, sprinkling of black dots over the legs and feet. One is tempted to assume an orderly progression in color pattern from hatching to maturity. Yet the assumption is hazardous, for birds of the same size and probable age might show any one of several 'solid' colors.

Turning now to birds with mottled legs and feet, we found the following five color combinations, in order of prevalence: orange and black, flesh and black, olive and black, yellow and black, and lastly, orange and flesh. (It is noted that the parent color, black, enters into the mottling in four of these five groups, appearing in fact in 372 out of the 377 mottled birds examined.) The first of these combinations, orange and black, contained 209 birds, 55% of the mottled and 10% of the whole number studied. The second mottled group, flesh and black, followed with 137 birds, 36.5% of the mottled and 7% of the whole. The remaining color combinations were found in comparatively few birds, in fact in only 31, or less than 2% of the whole. Of this little group fifteen were olive and black (4% of the mottled), eleven were yellow and black (2.9% of the mottled), and five were orange and flesh (1.3% of the mottled). Thus the mottled-legged birds showed no indication of order in the intensity or pattern of pigment present. Color blotches varied from dots to areas covering most of the legs. Scarcely two birds could be found with similarly arranged color patterns. Indeed, each bird's legs and feet usually differed in pattern of blotches, though not in the colors present. Again, birds of the same size and age had legs and feet of any one of the several combinations of colors.

At just what age color differentiation begins to appear I am unable to say. In the Cape Romain Refuge colony newly hatched young had legs and feet of purplish-flesh color. In fourteen birds, about ten days younger than the groups discussed above and measuring about ten inches in total length, six were black-legged and five orange. The remaining three were mottled, two

with yellow and black and one with flesh and black. In this small number, at least, color relationships appeared much the same as those shown in birds almost ready to fly.

From the foregoing it seems extremely difficult to determine any orderly sequence in the color changes undergone by the legs and feet, from the purplish-flesh of the newly hatched young to the black of the adult birds. For example, in the 'solid' group, it would seem that in some young slate may follow the color at hatching, and in turn darken to black by the time the bird is awing. In other young, orange or flesh may follow the purplish-flesh, and black may or may not be attained by the time the bird is flying. In the mottled groups the problem seems even more complicated. Here apparently any one of five color combinations may follow the livid coloring of the legs of newly hatched young. Again, in some birds these colors may change to black before, or after, the birds take wing. I have never seen a fully adult Royal Tern with other than black legs and feet. Some reported to me as being other than black I believe to have been birds not long on the wing.

That conditions similar to those discussed in this paper prevail in some other terns I am certain, since I have noticed indications in the Least and Cabot's Terns. Six of the latter were handled in the course of the above study. The legs of two were slate or black, two orange, one mottled flesh and black, and the last bird mottled greenish-yellow and black. These young were likewise nearly ready to fly.

While this study was in progress attention was paid to plumage variation in an attempt to ascertain whether there existed any correlation between plumage variations and those found in the coloring of legs and feet. While at least three plumage phases, light, dark, and mottled (with seeming intergrades) were apparent, no evidence was found of correlation between these various phases and the colors of legs and feet.

In the foregoing I am aware that there may be a percentage of error in the designation of colors. Time did not permit me to examine every bird personally and seldom do several workers see a color exactly the same. Nevertheless, I believe that the colors as given are approximately correct. Nor do I think that this factor enters seriously into the problem. In order to follow up this problem it is suggested that a group of young, numbering at least two hundred birds, be banded or marked shortly after hatching and that weekly observations be made on these individuals. For this purpose a small colony of several hundred birds would be far more suitable than a colony like the one at Cape Romain Refuge, numbering, as it does, some four or five thousand young. In such a colony the successive isolation at frequent periods would be exceedingly difficult, and would involve great labor and danger to the young.

To several friends I would express appreciation for aid rendered me in this work, especially to Mr. E. Milby Burton and Mr. G. Robert Lunz, Jr., of The Charleston Museum staff, and to Mr. Andrew H. DuPre, in charge of the Cape Romain Refuge.

I close with the question: Have the terns as a group only recently settled on black as their most suitable leg color?

The Charleston Museum
Charleston, South Carolina

AN OVERLOOKED RACE OF THE CALIFORNIA QUAIL

BY A. J. VAN ROSSEM

SINCE 1921, there has been in the Dickey collection a beautifully prepared series of California Quail from the desert side of the Sierra Nevada in central eastern California, collected by May Canfield and Laurence Huey. These are all in fresh, unabraded, fall plumage and represent without doubt the true color values of the species in the region involved. These specimens I would long ago have described as a very distinct race were it not for the description of the Lower California *achrustera* Peters, from the Cape Region.

In 1931, the late Donald Dickey reviewed the situation in company with the writer and insisted that the Inyo California Quail be named. For one reason or another I have delayed such action, but in the meantime have gathered pertinent data from the major collections in American institutions. Action at the present moment is stimulated by recent newspaper announcements that "thousands" of California Quail are being hatched from incubators and will be liberated in shot-out areas. We have here, then, a condition similar to that which is in effect in many parts of the eastern United States where the original stock of the Bob-white has been diluted by bastards of questionable origin,—bastards which not only obscure the characters of the original stock in a given area, but which are only questionably fitted to survive the vicissitudes of the new environment to which they are transported. It is to put on record the real characters of a certain geographic stock of the California Quail before its identity is lost in response to the demands of shotgun enthusiasts, that the following race is named:

Lophortyx californica canfieldae subsp. nov.

Type.—Male of the year in complete, fresh, post-juvenal plumage, J-1779, Dickey collection; Lone Pine, Inyo County, California, October 15, 1921; collected by May Canfield.

Subspecific characters.—Coloration very similar to that of *Lophortyx californica achrustera* Peters of the Cape Region of Lower California and distinguishable only by the even paler and more purely bluish or grayish (less brownish) chest, paler and less brownish flanks and under tail-coverts, and smaller, less highly arched bill. Differs from the geographically nearest race, *Lophortyx californica californica* (Shaw and Nodder) of the coast region from Monterey southward, the interior valleys and the western foothills of the Sierra Nevada, much as does *achrustera*—namely, in much paler and more purely slaty or bluish (less brownish) coloration and much paler and more restricted (sometimes obsolete) chestnut belly-patch.

Range.—Owen's Valley in east-central California.

Remarks.—The series of nineteen specimens, which are the basis of the above diagnosis, were all collected at the type locality between October 12 and 25, 1921. To make sure that these specimens did not represent an

introduced stock and were native to the locality, I requested information from the California Fish and Game Commission relative to possible 'plantings.' Under the date of July 17, 1924, they wrote as follows: "A diligent search . . . has failed to reveal any record of the introduction of the Valley Quail in the Owen's Valley. . . . The maintenance of a breeding stock of quail in Inyo County is due largely to the efforts of this Division (Southern) in feeding the birds during the severe winter of 1916."

It may be emphasized that the present proposal is in no sense the diagnosis of an intermediate but is that of the pallid and most grayish extreme of coloration exhibited by the species. Of the subspecies *californica*, the palest specimens are from the interior valleys (the San Joaquin and Sacramento) but even the palest of these are more closely similar to typical (coastal) specimens than to the Owen's Valley race. The few individuals examined from the Mojave (Palmdale) and Colorado (Palm Springs) Deserts of southern California are *californica*—most probably 'spill-overs' from the coastal slope.

Eleven fresh fall specimens from Adel, Lake County, Oregon (Dickey collection) are apparently not distinguishable from *californica* of the interior valleys of California. These birds were taken only nine miles from the type locality of *Lophortyx californica orecta* Oberholser (Cleveland Mus. Sci. Publ., 4: 2, 1932) but exhibit comparative color characters just the reverse of those ascribed to that race. They are slightly paler and grayer than typical *californica* instead of "darker" with the back "much more olivaceous." As to size, a supposed character of *orecta*, eight of these Oregon males give wing measurements ranging from 108 to 117 mm., while twenty *californica* picked at random from many localities measure from 105 to 115 mm.

It is with pleasure that I name this race for Mrs. May Canfield who in past years has enriched the Dickey collections with several thousand birds and mammals and whose collecting judgment has resulted in several of her specimens being named as types.

California Institute of Technology
Pasadena, California

THE IDENTITY OF *FORPUS CYANOPYGIUS* (SOUANCÉ)

BY A. J. VAN ROSSEM

OVER forty years ago, Salvin and Godman, in the 'Aves' section of their 'Biologia Centrali-Americana' (3: 581, 1897), stated very plainly that Souancé's cotypes of *Psittacula cyanopygia* in the British Museum were similar to their specimens from the Tres Marias Islands. Beyond this comment they took no action for the reason that they were somewhat over-conservative and rigorously refrained from recognizing geographic variations by name. From that time onward, no one seems to have given any weight to their comment and the Tres Marias race has continued to pass under the name of *insularis* Ridgway.

During a recent visit to the British Museum, the writer took occasion to investigate the matter and found the comment of Salvin and Godman to be justified. The male cotype, the chief basis of the description, is certainly a Tres Marias specimen. The female is, in all characters, an individual intermediate and may have come from almost anywhere on the adjacent mainland. The measurements of the male (59.11.22.38 British Museum) are: wing, 90 mm.; tail, 45; culmen from cere, 13.5; outer anterior toe, 13.5. The coloration is definitely of the darker, duller, and more bluish type which is characteristic of the Tres Marias race.

Under these circumstances there is no alternative but to include *Psittacula insularis* Ridgway in the synonymy of *Psittacula cyanopygia* Souancé and to rename the mainland race which formerly passed as *cyanopygia*. Therefore:

Forpus cyanopygius lutescens subsp. nov.

Type.—Female adult, 89.4.30.475 British Museum, Manzanillo Bay, Colima, Mexico, February, 1863; collected by John Xantus.

Subspecific characters.—Similar to *Forpus cyanopygius cyanopygius* (Souancé) of the Tres Marias Islands but coloration lighter and more yellowish (less bluish) green; rump of males lighter and more greenish blue; feet and (especially) bill smaller.

Range.—Northwestern Mexico from Colima, north through Nayarit to southern Sinaloa (Mazatlan).

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Pasadena, California

A NEW BLUE BUNTING FROM TAMAULIPAS

BY GEORGE MIKSCH SUTTON AND THOMAS D. BURLEIGH

AMONG the birds collected by John B. Semple and the authors in Mexico during February and early March, 1938, is a small series (five adult males, one subadult male, and two adult females) of *Cyanocompsa parellina* from the vicinity of Victoria and Gomez Farias, Tamaulipas, which represents a brightly colored, *small*-billed, undescribed race which we propose to call

Cyanocompsa parellina lucida subsp. nov.

Type.—Adult male, G. M. S. field catalogue No. 8078; Arroyo de la Presa, six miles north of Victoria, Tamaulipas, Mexico, February 26, 1938; George M. Sutton.

Subspecific characters.—Wholly unlike *Cyanocompsa parellina dearborni* Miller and Griscom (from Nicaragua and Yucatan) and *P. c. indigotica* Ridgway[1] (from Colima, Guerrero, Oaxaca, etc.) in being small-billed. Closer, therefore, to *C. p. parellina* (Bonaparte) (from Vera Cruz), and to *C. p. beneplacita* Bangs (from Nuevo Leon and extreme western Tamaulipas), but male *brighter throughout* than in either of these races, the general tone of the under parts in particular being decidedly bluer (less purplish), the rump lighter, and the blue of the crown extending more evenly over hind neck to back. Female apparently much as in *beneplacita*, and therefore paler, duller, and less rufescent brown than in typical *parellina* from Vera Cruz. Since we have but two females of *lucida*, differing somewhat in general tone *inter se*, it is impossible for us to offer any statement concerning differences between average female *lucida* and average female *beneplacita* at the present time. In any event male birds of the two forms are strikingly unlike.

Measurements.—Male: wing, 69.5–72.5 (average, 70.5) mm.; tail, 54–57 (average, 55.7); exposed culmen, 9.5–11 (average, 10.6); tarsus, 18.5–22 (average, 19.6).

Range.—So far as is known, the lowlands of southern interior Tamaulipas, Mexico, from Gomez Farias north to the general vicinity of Victoria.

Remarks.—The type locality of *Cyanocompsa parellina parellina* is Alvarado, Vera Cruz; that of *C. p. beneplacita* is Santa Leonor, Tamaulipas. This Santa Leonor, one of the late Frank B. Armstong's collecting stations, is said by Phillips (Auk, 28: 67, 1911) to be located "in the hill region west and north of Ciudad Victoria," presumably not far from the Tamaulipas-Nuevo Leon state-line. So close to this 'hill region' is the district in which we did our collecting, that we had expected all our *Cyanocompsa parellina* to be of the 'Santa Leonor' race. It was perfectly apparent from comparison with a topotypical male specimen of *beneplacita* (Carnegie Museum No. 84792), however, that our birds were not of that race. Our failure to find Santa Leonor thus far on the maps, and the striking dissimilarity of our Gomez Farias and Victoria birds from the topotypical 'Santa Leonor'

[1] *Passerina sumichrasti* Ridgway (from Oaxaca) has been shown to be a synonym of *Cyanocompsa parellina indigotica* Ridgway by Todd (Auk, 40: 68, 1923).

specimen mentioned above lead us to suspect that Santa Leonor may possibly not be so close to Victoria as available information would lead us to believe. In any event it is well to bear in mind that *beneplacita* is not intermediate between *parellina* and *lucida*. It is apparently the dullest of all races, *lucida* (insofar as *male* specimens are concerned) the brightest.

That male *lucida* and *dearborni* are much alike in color is instantly apparent. The bright coloration and small bill of *lucida* give it the appearance of being intermediate between *dearborni* and *parellina*, though its range scarcely justifies such a concept.

The authors wish to thank the authorities of the following institutions for lending comparative material: Carnegie Museum; Museum of Zoology, University of Michigan; American Museum of Natural History; U. S. Biological Survey and U. S. National Museum.

Cornell University
Ithaca, New York

U. S. Biological Survey
Gulfport, Mississippi

BELLROSE: AMERICAN EGRET NESTING ON ILLINOIS RIVER

WILLIAMS: BLACK-NECKED STILT NESTING IN SOUTH CAROLINA

U. OF MICH.

GENERAL NOTES

Audubon's Shearwater ashore on Long Island.—On July 24, 1938, after an extremely rainy week accompanied by southerly winds, my friend, Robert Rorden, picked up on the beach near Point Lookout, Long Beach, Long Island, New York, a dead shearwater which we identified as Audubon's Shearwater (*Puffinus lherminieri*). On taking the bird to the American Museum of Natural History, our identification was confirmed by Mr. John T. Nichols. Although the bird's feathers were all in place, to have made a satisfactory skin of it would have been difficult, so its skeleton was prepared and is now in the Museum's collection. Mr. Nichols estimated that the bird had been dead probably about two weeks and might have drifted a considerable distance after its death.—RALPH LIND, *35 Lewis Ave., Floral Park, New York.*

A Record of the Black-capped Petrel from Haiti.—Mr. L. Dalencour, civil engineer, of Port-au-Prince, Haiti, under date of June 30, 1938, forwarded to me a description of a curious bird found on the Champ de Mars in Port-au-Prince, Haiti, that seems certainly to have been the Black-capped Petrel (*Pterodroma hasitata*). The specimen, which was picked up alive, was said to have been white and dark gray varying to almost black in color, with palmated feet. The wing measured 44 centimeters in length. These notes on color and size are accompanied by a very exact sketch of the bill which leaves no question as to identity. It is interesting to add that, while the bird seemed fully grown, down feathers still adhered to the plumage on the back of the head, the back, and beneath the tail. It would seem therefore to be a juvenile not long from the nest, indicating that there is a nesting colony of this rare species somewhere in the mountains of this island. The bird was kept alive for a brief period but unfortunately was destroyed by a cat after the letter had been written to me regarding it.

In 'The Auk' for 1932 (vol. 49, pp. 107–108) I recorded another capture of this species by Dr. R. Ciferri at Moca in the Dominican Republic.—ALEXANDER WETMORE, *U. S. National Museum, Washington, D. C.*

American Egret nesting along the Illinois River.—Formerly the American Egret (*Casmerodius albus egretta*) nested abundantly with the Great Blue Heron and Cormorant in the Illinois River valley. The last-known colony of this species in Illinois was located a few miles below Hennipen (Putnam Co.) near the Illinois River. Containing hundreds of egrets' nests at one time, according to R. M. Barnes of Lacon, Illinois, the colony was reduced to five or six nests by 1907, and these were destroyed by plume hunters in that year.

The writer, while investigating a rookery of Great Blue Herons, Black-crowned Night Herons and cormorants at Duck Island, discovered an American Egret's nest on June 17, 1938. This was twenty miles below Peoria near the Illinois River. The egret's nest was situated, along with approximately seventy Great Blue Herons' nests in a flooded black-willow swamp between Big and Goose Lakes. It was placed twelve feet up in a living black-willow tree, which also contained two nests of the Great Blue Heron. At that time the Great Blue Herons' nests held nearly full-grown young, while the egret's nest contained three eggs. When first noticed, an adult was incubating the eggs, but upon closer approach the egret moved to a limb several feet from the nest, where it voiced alarm notes (Plate 5, upper figure). On July 8, Leo Borgelt, U. S. Deputy Game Warden, and the writer found three young about two weeks old in the nest. Both adults were in the vicinity of the nest, and one made

repeated ventures to it despite our presence twenty feet away. The young remained in a prone position, only once arising to call for food. When Mr. Borgelt visited the nest on July 15, the young clambered to the far side of the nest but made no attempt to leave. On July 27, all three young were completely feathered out and perched on limbs near the nest. The largest of the trio escaped, but the smaller two were captured and banded.

An interesting side-light was the presence of aigrette feathers on the breeding birds when first observed on June 17, their worn, frayed appearance on July 8, and the absence of these feathers by July 27. Throughout this period there were from twenty to thirty American Egrets in the same vicinity, but not one of the non-breeding birds displayed a vestige of these plumes.—Frank Bellrose, Jr., *Illinois Natural History Survey, Urbana, Illinois.*

Snow Geese in New England.—On November 26, 1937, a single immature Lesser Snow Goose (*Chen h. hyperborea*) joined the semi-domestic Canada Geese belonging to Richard Borden, in Fall River, Massachusetts. The bird was captured by Mr. Borden on the following day. Measurements taken by the writer are as follows: folded wing, 15.25 inches; tail, 6.00; culmen, 2.40; tarsus, 3.00.

On November 11, 1937, the O. L. Austin Ornithological Station at North Eastham, Massachusetts, enjoyed a rather similar experience. About noon of that day a Lesser Snow Goose was observed in company with the Station's semi-domestic Canada Geese and was present throughout the afternoon, but absent the following morning. Identification was made by Dr. Oliver L. Austin, Jr.

Mr. L. R. Nelson reports the visitation of a flock of seventy-five snow geese near Winchester, New Hampshire, on April 15, 1937, one-third of which were in immature plumage. He collected an immature male from this flock and identified it as *C. h. atlantica*. The only measurements I have of this specimen are: length, 31 inches; weight, five pounds, nine ounces.

Inasmuch as snow geese on Cape Cod are rare, and records are few, the following observation may be noteworthy. In the late afternoon of April 23, 1938, Maurice Broun, William H. Drury, Jr., and the writer, observed a flock of fifteen snow geese flying north off the Wellfleet shore of Cape Cod Bay. A 35-power telescope supplemented our 8-power binoculars and permitted very satisfactory observation. The observers deemed it safe to refer this flock to the race *atlantica*.

The status of snow geese in New England is admirably summed up by Bagg and Eliot in their recent 'Birds of the Connecticut Valley.' Single birds, when measured, have invariably proved to be Lesser Snow Geese (*Chen h. hyperborea*), while birds occurring in flocks of a dozen to a hundred or more individuals are apparently Greater Snow Geese (*Chen. h. atlantica*). This seems the logical expectation when one considers the flyways of these two races.—Roland C. Clement, *804 Walnut St., Fall River, Massachusetts.*

Turkey Vulture breeding in Norfolk County, Ontario.—While visiting the horticultural grounds of Mr. John G. Trafford in Simcoe, Norfolk County, Ontario, on August 18, 1938, I was shown two young of the Turkey Vulture (*Cathartes aura septentrionalis*). The birds were fully feathered, but the skin of the heads was practically black with some short brownish down around the nape of the neck and over the crown, a sure sign of immaturity. Mr. Trafford later in the day informed me that the Turkey Vultures were taken as downy young about six weeks or more prior to my visit, and that they were found in a piece of woodland about one mile northwest of Port Rowan, in South Walsingham township, Norfolk County. He was

unable to give me any exact information regarding the nesting site for the young down-covered birds had apparently wandered away from the nest, which, however, was believed to have been inside a nearby hollow log. There is apparently no previous published information on the breeding of the Turkey Vulture in Norfolk County for James L. Baillie, Jr., and Paul Harrington ('The distribution of breeding birds in Ontario,' Trans. Royal Canadian Inst., 21: 19, 1936) do not mention the county of Norfolk in their account of this species, and Arthur C. Bent ('Life Histories of North American Birds of Prey,' part 1, p. 25, 1937) only gives "Southern Ontario (probably Harrow, Kerrwood, and Coldstream)" among his list of localities under 'Breeding range.'—R. W. SHEPPARD, *1805 Mouland Ave., Niagara Falls, Ontario.*

Swallow-tailed Kite in Roanoke County, Virginia.—On August 21, 1938, I was called upon by Mr. C. D. Coon, well-known dog trainer near Salem, Virginia, to identify for him a hawk he had shot. Mr. Coon raises Bob-whites for stocking purposes, and had just freed a number of well-grown birds, when this hawk swooped down at them, and then alit nearby. He shot the bird, breaking its wing, and brought it to me alive. To my amazement, I saw it was a Swallow-tailed Kite (*Elanoides forficatus*), and would have tried to get it from him, but he was unwilling to part with it, and said he would have it stuffed. He asked if it was an injurious hawk, and I told him that no one could say that any hawk or owl would never, under any circumstances, attack a bird, but that the normal food of this kite was snakes, lizards, and such. To my knowledge, this is the second record of this bird for Virginia, and the first record of the capture of one in Virginia, the other being only a sight record.—ELLISON A. SMYTH, JR., *Salem, Virginia.*

Golden Eagle at Chilmark, Massachusetts.—While visiting the little public library at Chilmark last summer, I noticed a mounted Golden Eagle (*Aquila chrysaëtos canadensis*) which was labeled, on its stand, "Bald Eagle." It had the nape of an adult, the tail of an immature, and the tarsi completely feathered with white feathers. The label declared that it had been shot by Robert N. Flanders at the brick-yard, Chilmark, on December 28, 1906.—SAMUEL A. ELIOT, JR., *Smith College, Northampton, Mass.*

Golden Eagle takes wounded Horned Owl.—Since the creation of the Upper and Lower Souris Migratory Waterfowl Refuges, in North Dakota, we have noted some interesting changes in wildlife. Not the least of these is the sudden influx of Golden Eagles (*Aquila chrysaëtos canadensis*) that now stay with us during the entire winter. Oscar Thordarson, of the Upper Souris Refuge, made a most interesting observation on these birds recently, that I feel is worthy of record. He was making a study of the food habits of the predatory species on that area, and had occasion to collect a particular specimen of Great Horned Owl. He shot and wounded this owl, which flew weakly for a distance of about three hundred yards and landed in an open field. Mr. Thordarson immediately went to his car and drove in the direction of this intended specimen. Just before he reached the owl, however, a pair of Golden Eagles swooped down, and one of them picked up and carried away the still-struggling owl. This is the first time we had heard of a Great Horned Owl being taken by a predatory bird.—C. J. HENRY, *U. S. Biological Survey, Upham, North Dakota.*

Prairie Falcon in central Illinois.—While inspecting a collection of mounted birds on July 27, 1938, in the possession of O. S. Biggs of San José, Illinois, the writer was surprised to see an adult Prairie Falcon (*Falco mexicanus*) in a series of locally

killed Raptores. Upon inquiry, it was learned that the hawk had been shot near Emden (Logan County), Illinois, by an unknown person in February 1937, and brought to Mr. Biggs for mounting. The previous known records of this species in Illinois are as follows: two specimens taken at Rock Island, one of which is undated, while the other was collected in October 1857; and one individual taken at Warsaw on March 3, 1889.—Frank Bellrose, Jr., *Illinois Natural History Survey, Urbana, Illinois.*

Ruddy Turnstone in West Virginia.—The Federal Fish Hatchery at Leetown, Jefferson County, West Virginia, has approximately forty acres of bass breeding-ponds. These are mud-bottomed ponds and when drained are very attractive to shorebirds. During a two weeks' dry spell in June, 1938, several of the ponds went dry. Hundreds of Killdeers were present during the entire month and on June 19, Miss Eleanor Sions and the writer saw an adult Ruddy Turnstone (*Arenaria interpres morinella*) in full breeding plumage feeding with the Killdeers. We watched the bird for some moments and then drove for Mr. and Mrs. John Poland, and the four of us returned and watched the bird for half an hour or more. It called several times and allowed us a close approach. So far as published records show, this is the first occurrence of this bird in the State.—J. Lloyd Poland, *Martinsburg, West Virginia.*

Marbled Godwit on the Gulf Coast of Florida in Summer.—Recent records of the Marbled Godwit (*Limosa fedoa*) in Florida at any season are few in number, and apparently non-breeding flocks have not been reported since the days of early abundance. Hence the following observations should be of interest. On July 26, 1935, the senior author observed a flock of fifteen of these attractive birds on a tidal flat a short distance east of Carrabelle, Franklin County. They were very tame, and allowed close observation for some time. On May 26, 1938, he observed a flock of ten in a similar location on the extreme east end of Dog Island, two or three miles from the locality where the flock was seen in 1935. On a trip to the latter locality on July 4, 1938, to see whether any of the birds were present, we both observed seven individuals, six in a group and one alone. As was the case previously, the birds allowed a close approach, and were seen to be adults in summer plumage. After being flushed, they circled repeatedly within a distance of forty yards uttering their musical call notes, just as they did on the previous occasions. If this is typical behavior, their present scarcity is easily understood, for these flocks could have been wiped out entirely by the irresponsible gunner.—Henry L. Beadel, *Tallahassee, Florida*, and Herbert L. Stoddard, *Thomasville, Georgia.*

Black-necked Stilt nesting in South Carolina.—Having been informed by Major Peter Gething that he and Herbert R. Sass had seen three Black-necked Stilts (*Himantopus mexicanus*) in June about seven miles from Charleston near Folly Island, I determined to see if the birds were still there in July. On the 9th of July, 1938, I visited the flats and found one Stilt at the second waterhole. From the excited actions of this bird I was sure it had a nest or young, so with my son visited the flats the next morning hoping to locate the nest by flushing the bird. We stopped at the first waterhole to observe some Yellow-legs and I was sorry to see the Stilt feeding in this waterhole, but it was apparently unconcerned at our presence there. It soon flew about seven hundred feet to the second waterhole where we had seen it the day before and settled in one spot. We carefully marked this spot by the aid of a tuft of grass that stood out and then walked directly toward it. The bird took flight when we were about five hundred feet from the spot and was just as disturbed

at our presence as it was the day before. On reaching the place I found a nest with three eggs and the remains of a fourth egg. We did not touch the eggs or stay long as I hoped to get some pictures of the nest later.

Returning the next afternoon I was disturbed to see a Turkey Vulture apparently at the nest and eating something white, but was relieved to find that the vulture was really six feet away from the nest and eating a dead Snowy Egret. I took some pictures (Plate 5, lower figure), found the eggs cold and saw no sign of the Stilt. The next day I visited the nest morning and afternoon but did not see the Stilt and the eggs were cold. As the bird had not been seen since July 10 and the eggs had been cold for two days I concluded that the bird had deserted the nest, so I took it to the Charleston Museum for positive identification of the eggs. This is the first record to my knowledge of the Black-necked Stilt nesting in South Carolina.—Ellison A. Williams, *27 Limehouse St., Charleston, South Carolina.*

Black-necked Stilt at Saybrook, Connecticut.—On July 30, 1938, on the tidal flats in South Cove, at the mouth of the Connecticut River, a Black-necked Stilt (*Himantopus mexicanus*) was seen and instantly recognized by William Remington of Springfield, Massachusetts, a veteran observer, many of whose records were valued additions to 'Birds of the Connecticut Valley in Massachusetts.' Scanning the multitude of shorebirds and Green Herons ("at least fifty") on the mud, his binocular alighted on this Stilt, and he immediately used his telescope. "The black on the back of the neck reminded me of the Western Grebe at Springfield in December 1934," he writes, "as though painted on with a brush. The bird preferred to feed in deep water but occasionally came into shallows where its tremendously long, red legs looked almost ludicrous. It did not fly away but disappeared behind tall grasses. On the next day at low tide I could not find it."—Samuel A. Eliot, Jr., *Northampton, Massachusetts.*

Wilson's Phalarope host of Nevada Cowbird.—On June 6, 1938, while the writers were making a waterfowl survey on the Bear River Refuge in Utah, two nests of Wilson's Phalarope (*Steganopus tricolor*), both parasitized by the Nevada Cowbird (*Molothrus ater artemisiae*), were found. The nests, both well formed and flush with the ground, were approximately twenty-five yards apart and fairly well concealed in damp salt-grass on a small artificial island in the lower marshes. Each contained four phalarope and two cowbird eggs. Since these instances seemed from available information to constitute a new host record, subsequent visits to the nests were made to learn the ultimate fate of the eggs. On June 21, it was found that all the phalarope's eggs in one nest had hatched, and the two cowbird's eggs were left. These were later flooded. In the second nest on June 28, three phalarope's eggs were found hatched. The remaining phalarope's egg was pipped but had been destroyed by flooding along with the cowbird's eggs. One of the cowbird's eggs in the first nest was evidently infertile, but the others were advanced in development.—C. S. Williams and A. H. Trowbridge, *U. S. Biological Survey, Brigham, Utah.*

Northern Phalarope in Grady County, Georgia.—On October 3, 1937, a Northern Phalarope (*Lobipes lobatus*) was observed on a small woodland pond on Sherwood Plantation, Grady County, Georgia. When first noted, the bird was running about on the lily-pads which largely covered the water. The specimen was collected and preserved, and proved to be a male in winter plumage. The locality where the bird was collected is about fifty miles from the nearest point on the Gulf of Mexico 'as the crow flies.' There had just previously been a 'Gulf disturbance' to

the west which may have had a bearing on the presence of this bird in such an unusual location.

I am indebted to Mr. A. H. Howell of the U. S. Biological Survey for the information that there is apparently only one previously published record of this species for the State: a specimen taken near Savannah, May 24, 1933, by Ivan S. Tomkins (Auk, 51: 252, 1934).—HERBERT L. STODDARD, *Sherwood Plantation, Thomasville, Georgia.*

Franklin's Gull in Ohio.—Franklin's Gull (*Larus pipixcan*) was placed on the list of birds found in Ohio on the strength of a mounted specimen discovered by Lynds Jones (Wilson Bull., 14: 20, 1907) in the taxidermy shop of Thomas M. Earl in Columbus. This bird was shot at the Licking Reservoir (Buckeye Lake) October 15, 1906. More than twenty-four years elapsed before the species was again reported from the State. The current A. O. U. 'Check-list of North American Birds,' fourth edition, lists it as accidental in Ohio. As late as 1932, Trautman (Bull. Ohio Dept. Conservation, 1: no. 3, p. 8, 1932) considered it as casual. Since 1930, so many occurrences of Franklin's Gull in Ohio have been reported that our conception of its status has changed considerably. These records follow.

On December 22, 1930, an "immature bird in first winter plumage" was found at Fairport Harbor, Lake County, Ohio, by E. A. Doolittle (Wilson Bull., 43: 227, 1931; Bird-Lore, 33: 61, 1931). What was probably the same individual was seen by a friend of Mr. Doolittle on December 28, by Mr. Doolittle on January 3 and 8, 1931; and again by the same friend on January 18. This gull was also seen on January 8, 1931, by Emerson Kemsies and John W. Aldrich of the Cleveland Museum of Natural History. On November 13, 1932, one was seen flying over fields near Muddy Creek, southern Ottawa County, Ohio, by Milton B. Trautman. On November 18, 1932, O. E. Ehrhart found a wounded adult along Flat Rock Creek seven miles south of Antwerp, Paulding County, Ohio. This was one of a flock of six or seven which was shot into by an unknown hunter. Several were killed and dressed by the hunter who mistook them for ducks! The specimen was mounted and is now in Mr. Ehrhart's private collection at Antwerp, Ohio. On November 19, 1932, I saw two feeding along the Lake Erie shore with a flock of Bonaparte's Gulls in Jerusalem Township, Lucas County, Ohio. On December 3, 1933, my brother, Bernard R. Campbell, and I (Wilson Bull., 46: 122, 1934) found on Maumee Bay, Washington Township, Lucas County, Ohio, an immature female which was somewhat oil-soaked but still able to fly. This bird was collected and prepared by my brother and the skin given to the Ohio State Museum. On July 4, 1934, my brother and I saw an adult with a black head and red bill at Little Cedar Point, Lucas County, Ohio. This record appears to be the only occurrence of Franklin's Gull in breeding plumage within the State. On October 7, 1934, I saw a group of three (Baird, Bird-Lore, 36: 373, 1934) with a flock of Ring-billed Gulls on the shore of Maumee Bay, Lucas County, Ohio. On October 6, 1935, I saw one near Little Cedar Point, Lucas County, Ohio, and an adult at the same place November 28, 1935. On October 20, 1935, I found one on the Maumee River Rapids, Lucas County, Ohio. On September 12, 1936, two were seen in Carroll Township, Ottawa County, Ohio, by Lawrence E. Hicks. On September 27, 1936, at the mouth of the Maumee River, Toledo, Ohio, I collected a male in first fall plumage which had a strong suffusion of peach color on the breast. On October 4, 1936, I found another at the same place. On October 18, 1936, I located two on the shore of Maumee Bay, Lucas County, and collected one, an immature male. This and the above specimen were given to Ohio State Museum.

On October 26, 1936, I saw one on the Maumee River at Riverside Park, Toledo, Ohio. On November 15, 1936, Lawrence E. Hicks discovered one at Maumee Bay, Lucas County, Ohio, and on November 22, 1936, I saw one flying over fields in Jerusalem Township, Lucas County, Ohio. September 13, 1937, an immature female was collected at Ashtabula, Ohio, by Lawrence E. Hicks (Walker, Bird-Lore, 39: 473, 1937). The skin was presented to Ohio State Museum. On October 3, 1937, Milton B. Trautman and I saw four at the mouth of the Maumee River, Toledo, Ohio (Walker, Bird-Lore, 39: 473, 1937); October 10, two were seen by Edward S. Thomas and Miss Marion Washburn at the O'Shaugnessey Reservoir, Delaware County, Ohio (Walker, Bird-Lore, 39: 473, 1937); on October 14, 1937, I found one at Maumee Bay, Lucas County, Ohio; on October 17, 1937, one at Riverside Park, Toledo, Ohio; and on October 24, 1937, one near the mouth of the Maumee River, Toledo, Ohio.

From these records I conclude that: (1) since 1930, a few have regularly occurred in the autumn at the western end of Lake Erie, and less regularly in the remainder of the State; (2) it is exceedingly rare in summer and apparently absent in spring; (3) either the species has increased as a transient since 1930 or, what is more probable, an increase in the number of observers and in their field experience, has resulted in a greater number of records, since the birds are easily confused with Bonaparte's Gulls.

This gull arrives in Ohio about October 1 and a few remain until the western end of Lake Erie freezes over. The earliest recorded arrival is September 12, 1936, and the latest date of departure January 18, 1931. There is one occurrence in summer, July 4, 1934, but none in spring. In early autumn, Franklin's Gulls associate with Ring-billed and Herring Gulls, but during November they seem to prefer the society of Bonaparte's Gulls. In all my sight records, I have carefully eliminated any possibility of confusing Franklin's Gull with the Laughing Gull. The latter bird has not been reported for Ohio. Compared with the Laughing Gull, the small bill and white throat of the immature Franklin's Gull form easily distinguishable field marks at a reasonable distance. Of my sight records, only three identifications were made at a distance of more than two hundred feet.

I wish to acknowledge my indebtedness and express my thanks to Edward S. Thomas, Curator of Natural History, Ohio State Museum, for checking the plumage of specimens of Franklin's Gull deposited there, and to Dr. Josselyn Van Tyne, Curator of Birds, and Milton B. Trautman, Assistant Curator of Fishes, of the University of Michigan Museum of Zoology, for aid and criticism in preparing this article.—Louis W. Campbell, *Toledo, Ohio.*

Notes on jaegers and gulls of Colorado.—In checking over the various bird collections in Colorado, we have been surprised at the scarcity of large gulls and consequent lack of material to determine the species represented in our State. There were less than a dozen all together, the majority being *Larus argentatus smithsonianus.* In the State Teachers College collection at Greeley, Colorado, we found an immature jaeger identified as *Stercorarius parasiticus.* We considered it *longicaudus,* which has not been recorded for Colorado, and Dr. Alexander Wetmore verified our identification. The specimen, an immature male (S. T. C. no. 320) was collected on Windsor Reservoir, Weld County, Colorado, on October 18, 1902, by Elmer Sutter.

This past spring, on March 26, 1938, we were at Mile High Duck Club, in Adams County, with Robert B. Rockwell, and saw a second-year Glaucous Gull (*Larus hyperboreus*) cruising over one of the ponds in company with two dark-primaried birds, which were probably Herring Gulls. As the light was good, we had ample

opportunity to make a satisfactory sight identification. Later the same day we walked along the shore of Barr Lake, a large reservoir in the same area where several hundred gulls were congregated, and were surprised to see another, or the same one, close enough to identify. As we hesitated to publish a sight identification of such a rare gull, which has not been recorded from the State, we attempted to collect a series of gulls, with rather interesting results. We obtained a rubber boat and returned to Barr, March 27 and 28, collecting in the early morning the first day, and in the late evening, with half a gale bouncing the boat around, on the second day. There was no chance to choose specimens; it was a case of taking anything possible, and the gulls did not prove too cooperative. Four specimens were obtained March 27, and four the following day, and much to our surprise, we had five species of gulls, three of which, *Larus hyperboreus*, *Larus californicus*, and *Larus argentatus thayeri*, had not been listed authentically from Colorado. The last, however, was represented in the Museum, but the specimen had been erroneously identified.

In the following two weeks several trips were made to Barr with Robert B. Rockwell and Fred G. Brandenburg, and additional specimens were secured, which gave us a little information on our wintering gulls, but unfortunately work was started too late to determine the number and relative abundance of the various species on Barr, or to work on any of the other large reservoirs. The following birds were represented in our collection. All were taken on Barr Lake, Adams County, Colorado.

Glaucous Gull, *Larus hyperboreus*.—Two specimens were secured, both being beautiful, light-colored second-year birds with a trace of the first-year plumage. The first, collected March 28 (C. M. N. H. no. 18799), was a female, and the second (C. M. N. H. no. 18800), taken April 1, was a male. A third specimen was seen on the latter date among the several hundred birds on Barr Lake.

Herring Gull, *Larus argentatus smithsonianus*.—Previous authors have considered this species rare in Colorado. Judging by our brief experience it is a common bird *locally*, either as a migrant in the early spring, or as a winter resident. A fine series of specimens ranging from high-plumaged birds to those in first-year dress was secured between March 27 and April 15.

Thayer's Gull, *Larus argentatus thayeri*.—A beautiful specimen, a male, in semi-adult plumage, with pearl-gray mantle of the adult, and gray wings of the young (C. M. N. H. no. 18798), was collected March 27. An immature first year, a male (C. M. N. H. no. 18886), one of two flying together, was taken April 20, which we list tentatively as *thayeri*. The coloration of this specimen is not typical, and the identification may prove erroneous. There is another specimen, an unsexed immature in first-year plumage in the Museum collections, however (C. M. N. H. no. 880), collected at La Salle, Weld County, on November 3, 1912; we have included a discussion of this specimen below under the heading of Glaucous-winged Gull.

Ring-billed Gull, *Larus delawarensis*.—This species was uncommon during the latter part of March, but was abundant by April 9. No attempt was made to secure specimens, as they are well represented in our collection.

California Gull, *Larus californicus*.—It is surprising that there have been no authentic records of this species from Colorado, for it nests abundantly in Utah, our neighbor to the west. Lincoln (Condor, 1919, p. 237) has shown that the only specimen available from the State, recorded as *californicus*, was misidentified and he suggested the withdrawal of the species as a State bird. Among the specimens obtained at Barr Lake was an immature *californicus* (C. M. N. H. 18802), taken March 27. Dr. Joseph Grinnell and George Willett verified our identification.

GLAUCOUS-WINGED GULL, *Larus glaucescens*.—This species should be withdrawn from the list of Colorado birds. We recorded the species from the State (Condor, 39: 132, 1937) on the basis of an immature specimen (C. M. N. H. no. 880), identified by Dr. H. C. Oberholser. It was collected at La Salle, Weld County, on November 3, 1912. Allan Brooks questioned the record and the specimen was sent to him for examination, and he wrote me as follows: "It emphatically is not *glaucescens*. While it agrees superficially with juvenile *thayeri* its tail is much whiter, the outer tail feathers being white barred only toward their tips and the central rectrix is strongly barred with white on its basal half. The measurements of bill and tarsus are much shorter than in any *thayeri* in my collection and agree exactly with a juvenile female *kumlieni* from Nova Scotia. I take it to be a dark juvenile of *Larus kumlieni*." We then sent the specimen to P. A. Taverner, at Ottawa, and he compared it with his specimens, pronouncing it not *kumlieni*, but either *thayeri* or *californicus*. Dr. Ira Gabrielson examined the specimen while Mr. Taverner had it, and he called it *thayeri*. Bailey took the specimen to Los Angeles in August, and he and George Willett compared it with specimens of *thayeri* in the Bishop collection, and were able to match the bird with similarly plumaged ones from Arctic Alaska. The skin was then sent to Dr. Oberholser and he reidentified it as *thayeri*. All ornithologists who have had occasion to attempt the identification of immature gulls will complete their task with a sense of humility, and a realization of how little material there is available from breeding areas which may be used for comparative purposes. And so, although it was not an unanimous decision of the various judges (Allan Brooks being doubtful) we shall have to conclude that the specimen recorded as *glaucescens* is *Larus argentatus thayeri*, until, at least, someone questions the identifications of the specimens in Dr. Bishop's collection!—ALFRED M. BAILEY and ROBERT J. NIEDRACH, *The Colorado Museum of Natural History, Denver, Colorado.*

Remiges of the Atlantic Murre, a correction.—In a note on 'Development of remiges in the Atlantic Murre' (*Uria aalge*) (Auk, 55: 529, 530, 1937) I stated, ". . . it has never been recognized that the young bird at the time of leaving the nest island and going to the water has no remiges." I now find that this fact was previously known and published by H. F. Witherby (Practical Handbook of British Birds, pt. 2, pp. 792–798, 1924). Mr. Witherby states, "As in Razorbill tail-feathers, primaries and secondaries do not commence to grow until beginning of moult to next plumage but primary-coverts and greater coverts give appearance of miniature remiges."—R. A. JOHNSON, *150 East St., Oneonta, New York.*

The Swifts of Panamá.—Unless otherwise stated, all quotations below are from pages 318, 319, of 'The Ornithology of the Republic of Panamá' by Ludlow Griscom (Bull. Mus. Comp. Zool., 78: no. 3, April 1935). Three forms have been added to his list of his 'Family Micropodidae,' as well as various localities and dates of interest.

Streptoprocne zonaris albicincta.—"Throughout in the mts.," but visiting the lowlands at least occasionally after the breeding season, as I infer from two specimens in the Princeton Museum of Zoölogy shot September 4, 1936, by H. Wedel in a dry stream-bed near the Cricamola River (Province of Bocas del Toro), only about fifteen miles south of where the river flows into the Chiriquí Lagoon. One is an immature male, iris 'black-brown,' the other an adult female, iris 'nubian brown'; each is labeled 'feet plum blue-black.' Neither had the gonads enlarged. Peters (Bull. Mus. Comp. Zool., 71: 314, 1931) records two taken at Fruitdale, west shore of Almirante Bay, November 17, 1928.

Chaetura pelagica.—"Almirante, 2 records in fall." This refers to two taken at Cocoplum, Bocas del Toro, October 28, 1927 (Chapman, Auk, 48: 119–121, 1931) and one on the Changuinola River, October 24, 1926 (Peters, loc. cit.). Since then, Wedel has sent to the P. M. Z. two more collected by him near Port Obaldia, in extreme eastern Panamá, on April 24 and 25, 1934 (Rogers, Auk, 54: 392, 1937), and Chapman has recorded (ibid.) two flocks, most probably of this species, apparently migrating northward, some miles off Porto Bello, April 18, 1937. And now Wedel has sent us two males (testes not enlarged) shot by him as they were flying over the pasture before a farmhouse ('Holstein') on the Cricamola some sixteen miles south of its mouth on April 12 and May 14, 1937, respectively. So now it seems reasonable to deduce, tentatively, that our Chimney Swift is a regular transient along the Caribbean lowlands of the Republic of Panamá in (March?), April, and May and again in October (and November?), with some indication that the northbound stream splits somewhere in the region of Porto Bello, one route turning northward over the water bound probably for the Atlantic seaboard of North America, the other continuing along the lowlands of Panamá, Nicaragua, etc., to Texas and northward.

Through the courtesy of the Academy of Natural Sciences of Philadelphia and of the American Museum of Natural History, I have examined the two skins collected at Eden, Nicaragua, by Huber and Street, April 1, 1922 (Proc. Acad. Nat. Sci. Philadelphia, 84: 218, 1932), and compared them with the great series of *Chaetura pelagica* in the American Museum as well as with our own series. Their white throats and glossy primaries *can* be matched among specimens from the United States. Our Panamá skins tend to have this clean appearance, and I believe it to be due to months of living in hollow trees instead of in sooty chimneys. Of a pair in the P. M. Z. taken in Illinois, May 18, 1916, the one which was, if anything, the darker below, has now a white throat and lighter under parts since I cleaned it with carbon tetrachloride.

Chaetura gaumeri richmondi.—"Western Chiriqui." Possibly intermediate between *richmondi* and *ochropygia.*

Chaetura gaumeri ochropygia.—Described as new in the 'Scientific Publications of the Cleveland Museum of Natural History' (7: 68, 1937). The describer says further: "Known from only the Azuero Peninsula, southern Veraguas, Panamá . . . rather a common bird both at sea level and at the higher altitudes [3000 feet] . . . on a few occasions the air seemed to be simply swarming with the birds."

Chaetura chapmani chapmani.—"Canal Zone, 1 record." This refers to two females collected at Gatun, July 9, 1911, by L. L. Jewel. One of these is now in the Academy of Natural Sciences of Philadelphia, one in the P. M. Z.

Chaetura andrei meridionalis.—The only record, hitherto unpublished, is of a female, ovary not enlarged, taken by Chapin on the P. M. Z. expedition of 1923, from a large flock of swifts found on August 4 flying low over the open, marshy country just back of the coast, several miles southeast of Juan Diaz and twelve to fifteen miles east of Panama City. Iris dark brown, feet and claws black. This capture may indicate the extent of the winter range of this form from southern South America. Some of the other swifts in the flock seemed blacker and with much shorter tails than the only one we were able to secure.

Chaetura spinicauda spinicauda.—"Permé, Darien; probably Canal Zone and Pearl Islands also." This refers to three males in the Museum of Comparative Zoology from Permé, "about five miles west of Anachucuna, at the head of the bay of the same name, and not more than twenty-five miles from the Colombian border" (Griscom, Bull. Mus. Comp. Zool., 72: 303, 328, 329, Jan. 1932). The P. M. Z. has

fourteen specimens collected by Wedel near Port Obaldia (within eight miles of Colombia), as follows:

♀ ovary somewhat enlarged Mar. 30, 1932
♂ testes somewhat enlarged Apr. 29, 1934
♂ testes much enlarged May 16, 1933
♀ ovary not enlarged May 16, 1933
♀ ovary not enlarged July 8, 1933
— July 8, 1933
— Aug. 24, 1935
♀ ovary not enlarged Aug. 26, 1935
♂ testes much enlarged Aug. 26, 1935
♂ testes not enlarged Nov. 2, 1934
— Nov. 23, 1934
♀ ovary not enlarged Nov. 23, 1934
♂ testes much enlarged Nov. 23, 1934
♂ testes not enlarged Nov. 23, 1934

Feet 'midnight blue,' 'purplish blue,' 'plum blue,' 'purplish black,' 'blackish purple,' 'black.'

Chaetura spinicauda fumosa.—"Pacific slope, Volcán de Chiriquí."

Chaetura cinereiventris phaeopygos.—"Almirante (Wedel, Smith, Benson)." Wedel has sent to the P. M. Z. six more specimens, from the Cricamola River, as follows:

♀? ovary not enlarged May 1, 1937
♂ testes much enlarged May 12, 1937
♂ testes much enlarged May 15, 1937
♂ testes much enlarged May 17, 1937
♀ ovary not enlarged Sep. 3, 1936
♂ testes not enlarged Sep. 3, 1936

Iris 'black,' feet 'plum blue.' Shot in dry stream beds about fifteen to seventeen miles south of the mouth of the Cricamola.

Chaeturellus brunneitorques brunneitorques.—"Mts. of Veraguas; to be expected elsewhere."

Cypseloides fumigatus.—The only record, now published for the first time, is of a male, testes not enlarged, shot by Wedel at Armila, just west of Port Obaldia, July 4, 1932, and now in the P. M. Z. Iris and feet 'black.' I use a binomial for this form, considering the bird described by Rothschild as *C. f. major*, from Argentina, a valid species. It is not only much larger (wing, 148–158 mm., one 163), but has actually smaller (relatively much smaller) feet (tarsus, 12–14 mm., one 15), the tarsus and toes more slender; *fumigatus* has a wing only 139–142 mm., tarsus, 15–16. *C. major* further differs from *fumigatus* in its mummy-brown instead of brownish-black coloration, the crown as well as the forehead scaly, the throat not paler than the rest of the under parts, and no white chin, and still further in its rounded rectrices with normal shafts compared with the stiff shafts and at least sometimes tapering tips of the rectrices of *fumigatus*. I am indebted to the American Museum of Natural History for permission to use their seven skins of *major* and two of *fumigatus* in this comparison in addition to the two of the former and one of the latter in the P. M. Z.

Panyptila cayennensis.—"Chagres River; Cape Garachiné; recently breeding in Canal Zone." During our stay at Tapia (on the road several miles east of Juan Diaz), July 24 to August 8, 1923, from two to five of this lovely species were generally to be found frequenting certain palms behind Señor Alexandro de la Guardia's house which he had so kindly loaned us. We looked in vain for a nest. A female, ovary not enlarged, was collected August 6. See Greenway's note in 'The Auk' (51: 377–379, 1934) on the nesting of this swift on the piazzas of the Ancón Hospital and on the walls of the Canal, and occupying a nest even inside a building.—Charles H. Rogers, *Princeton Museum of Zoology, Princeton, New Jersey.*

Southern Downy Woodpecker in Ohio.—Several years ago the writer became interested in determining the status of the Downy Woodpeckers (*Dryobates pubescens*) occurring in Ohio. Birds taken in northeastern Ohio (Ashtabula County) proved to

be typical of the northern race *medianus*. Fourteen males and thirteen females taken for the Cleveland Museum and the Ohio State Museum in various localities of southeastern Ohio, were also referable to *medianus*, though averaging definitely smaller than those from northern Ohio. Northern Ohio birds were also somewhat heavier in average weight.

In the spring of 1936 a check was made on an area much farther south—bottomland along the Ohio River in the extreme southern tip of the State, Lawrence County. This locality is opposite the mouth of the Big Sandy River, a stream with a valley extending a hundred miles to the southward deep into Kentucky and West Virginia. It seemed conceivable that individuals representing the southern form might have followed this valley highway north to the Ohio border, especially during the height of the spring migration. Examples are numerous in other species of occasional individuals migrating in spring far beyond the usual northern limits of the breeding range. On May 2, 1936, two female Downy Woodpeckers were taken in Lawrence County, Ohio, along the Ohio River, one near Proctorville, the other near South Point. These birds (now 7075 and 7076 in the Ohio State Museum collection) have recently been determined by Dr. H. C. Oberholser of the U. S. Biological Survey as *D. p. pubescens*. Neither is wholly typical but both must be referred to this race. In addition to their small size (wing length less then 90 mm.) both birds show the dark coloration (or soiling) of the under parts characteristic of most *pubescens* specimens. Other specimens similar to the two described above have since been taken by the writer in the lowlands of eastern and southeastern Kentucky. Wetmore ('Observations on the birds of West Virginia,' Proc. U. S. Nat. Mus., 84: 412, 1937) referred all specimens examined from West Virginia to *medianus*, but stated that those from lowlands along the Ohio River were smaller. All birds examined by the writer from Ohio which were definitely breeding individuals, can likewise be referred to *medianus*. The *pubescens* individuals recorded above may represent migrants or wanderers rather than breeders, as their gonadal development was not that of breeding birds.—Lawrence E. Hicks, *Ohio State University, Columbus, Ohio.*

American and Arctic Three-toed Woodpeckers in the Adirondacks.—While on a multi-day camping trip in the northern Adirondack Mountains (Essex County, New York), my brother, Ronald Shainin, and I observed a male American Three-toed Woodpecker (*Picoides tridactylus bacatus*) on July 20, 1937. We were on the Johns Brook trail and had just crossed the junction of Hogback Brook and Johns Brook, headed in a southwesterly direction toward Mount Marcy, when we heard a woodpecker drilling. In a short time we located the bird on the trunk of a huge balsam, and instantly recognized it by the yellow crown and the transversely barred white patch extending down its back. After we had studied the bird with eight-power binoculars for more than half a minute, it flew across Johns Brook into the dense virgin timber on the south side.

This species is one of the rarest birds in the Adirondacks, where it is at the southernmost limit of its range in the East. Less than half a century ago it was fairly common in the higher mountains of the northern Adirondacks. E. H. Eaton, in his paper, 'Birds of the Mount Marcy region of the Adirondacks' (1909, p. 44), reporting on a survey in 1905, writes, "The American Three-toed Woodpecker was nearly as common as the Black-backed species [Arctic Three-toed Woodpecker (*Picoides arcticus*)], but only two families of young were found, one of these being on the slope of Mt. Marcy at an elevation of 4000 ft." Since that time, however, this far-northern species has markedly declined in numbers. Charles H. Rogers saw two individuals

at Raquette Lake, Hamilton County, in the summer of 1921, but Aretas A. Saunders (Roosevelt Wild Life Bull., vol. 5, no. 3, 1920) during two summers of intensive field work (1925 and 1926) in Essex County, found no trace of it. Geoffrey Carleton, of New York City, an authority on Adirondack bird-life, knows of no records since C. H. Rogers's until 1931. Between that year and my observation in 1937, the American Three-toed Woodpecker has been recorded three times in summer as follows: July 17, 1931, Mount Ampersand, Franklin County (Geoffrey Carleton); July 23, 1933, Mount Marcy, Essex County (Dr. R. W. Darrow); August 4, 1936, Whiteface Mountain, Essex County (Dr. R. W. Darrow). Each of these observations was made within twenty-five miles of Mount Marcy, highest mountain in New York State.

The American Three-toed Woodpecker is usually found in belts of balsam, spruce or tamarack and according to Carleton, is likely to be found in the fairly well-defined coniferous belt extending from Essex County through Franklin and Hamilton Counties to St. Lawrence County. Until Dr. Robert W. Darrow undertook active field work in the Adirondacks six years ago, very little was known of the winter status of the species. He writes me, "In addition [to Essex County records] in Hamilton County, near 'The Plains,' on the Moose River and up Otter Brook, I have seen this species regularly in fall (November) and winter (January, February and March) during the past six years, whenever I have had occasion to travel in this area. Although I have not had the opportunity to visit the above region in summer, I believe there would be little difficulty in locating breeding birds." (The last recorded nests in the State were found by Eaton in 1905.) From Essex County he has recorded the species in winter on four occasions: January 17, 1932, South Meadows (town of North Elba); February 23, 1932, Mount Fay (near Lewis); January 11, 1933, Jay Mountain (near Lewis); March 25, 1935, Chapel Pond.

The Arctic Three-toed Woodpecker (*Picoides arcticus*), is more common in the Adirondacks, although it follows closely the American Three-toed in environment, habits and range. To a certain extent, both are Canadian Zone species, but the Arctic exhibits more of a migratory instinct. It, too, has decreased greatly in abundance, although today it may be found by the alert observer in most localities above 2000 feet in growth consisting chiefly of conifers. It is fairly numerous throughout Hamilton County, according to Dr. Darrow, and in Essex County it is most common in the southwestern part, drained by the headwaters of the Au Sable, Boquet and Hudson Rivers, where it is more noticeable in the winter. In my own observation of this species, I found it to show signs of almost absurd tameness; two individuals allowed me to study them at very close range.—VINCENT SHAININ, *255 Ocean Ave., Brooklyn, New York.*

Cassin's Kingbird in Colorado and Oklahoma.—My first contact with Cassin's Kingbird (*Tyrannus vociferans*) was in the latter part of May, 1921, in western Baca County, Colorado, west of Springfield and northwest of Graft, in the foot-hills. Three nests were found by my companion, Tom Pate, and myself. One nest was in the course of construction, one nest contained one egg and the third two eggs. All nests were placed in cottonwood trees.

On June 19, 1935, I visited the Powelson Ranch, some 10 or 11 miles northwest of Boise City, Cimarron County, Oklahoma, among the brakes on the south side of the Cimarron River. Several pairs of Cassin's Kingbirds were observed. One pair in particular had a nest in a cottonwood tree close to the ranch house. It was situated on a horizontal outer branch seven feet up and was of typical construction. The

parent bird was rather tame and allowed me to photograph it on the nest by elevating my camera and tripod. On June 23, 1935, after returning from Eagles' Nest Lake, New Mexico, I again visited the Powelson Ranch and found the female still sitting on the four eggs.—WALTER COLVIN, *Box 109, Arkansas City, Kansas.*

Arkansas Kingbird in Maryland—On September 18, 1938, I found an Arkansas Kingbird (*Tyrannus verticalis*) resting on wires beside the highway in the edge of St. Mary's City, Maryland. It moved about in feeding, finally flew to a dead stub in the top of a distant tree, and then continued out of sight. At once I located another, and while observing it heard a call that may have come from the individual under observation or from a third bird; as to its source I was not sure. Though I did not secure a specimen I have no doubt whatever as to the identification as I was watching the birds with an eight-power binocular, and at one time was within fifty feet of one of them.

Previous records for the State are two in number: a specimen purchased in the Washington market in 1874 by Jouy, and one collected near Denton, Maryland, by S. E. Perkins, III (see Lincoln, Auk, 49: 88–89, 1932). Both of these birds are in the U. S. National Museum.—ALEXANDER WETMORE, *U. S. National Museum, Washington., D. C.*

Arkansas Kingbird in Wisconsin.—On June 21, 1936, a pair of Arkansas Kingbirds (*Tyrannus verticalis*) was found about six miles from Madison on the Pine Bluff road. One of the birds was working on a nest placed at the junction of a small limb with the trunk of a large dead locust. I did not return to the vicinity until July 2, but the birds were not seen again on this or subsequent visits.—A. W. SCHORGER, *168 North Prospect Ave., Madison, Wisconsin.*

The identity of *Garrulus sordidus* Swainson.—Hellmayr (Cat. Birds Amer., 7: 56–57, 1934) has applied the name of *Aphelocoma sordida sordida* (Swainson) to the race of this species which inhabits the northeastern section of the Mexican plateau, thereby sinking *Aphelocoma sordida potosina* Nelson as a synonym of *sordida* and setting up *Aphelocoma sordida sieberii* (Wagler) as the name for the race of the southern plateau.

Among the many courtesies extended to me by the authorities in charge of the collections at Cambridge University was the privilege of examining the many Swainson types now housed at that institution, among them the type of *Garrulus sordidus*. Swainson's original description (Philos. Mag., new ser., 1: 437, June, 1827), differs from his more detailed diagnosis published five years later (Zool. Illustr., (2) 2: pl. 86 and text, 1832) in that the measurements first given are somewhat smaller and for the original "Real del Monte" is substituted simply "the tableland of Mexico." However, since Swainson in the later publication is specific about having only one specimen, there can be no cotypes and the specimen in the collection at Cambridge must be regarded as the type. It is a Bullock skin, typical of the specimens contributed by that collector save that it is much more fully stuffed than is usual. The tag reads "*Garrulus sordidus*. Sw. / Bullock. Mexico." It is in very fair condition except that it is definitely (adventitiously) dirty below, hence, presumably, the specific name '*sordidus*.' It is typical of the southern-plateau race and provides the following measurements: wing, 175 mm.; tail, 158; culmen, 29; tarsus, 45; middle toe minus claw, 25 mm.

The necessary nomenclatural adjustments are that *potosina* Nelson is resurrected for the northeastern race and *sieberii* of Wagler becomes a synonym of *Aphelocoma*

sordida sordida (Swainson).—A. J. VAN ROSSEM, *Dickey Collections, California Institute of Technology, Pasadena, California.*

Breeding range of the Ohio House Wren.—On July 4, 1938, I collected a House Wren on Meadow Mountain, four miles south of Bittinger, Maryland, that proves to be *Troglodytes aëdon baldwini*, marking an extension of the previously known breeding range of this bird into that State. Probably this will prove to be the breeding form of the mountain area of western Maryland above two thousand feet elevation. Another Ohio House Wren was collected on the Blackwater River, eight miles south of Davis, West Virginia, on July 3, a region where this form was expected in view of an earlier specimen from Flanagans Hill in the Canaan Valley, a little farther south in the same county.—ALEXANDER WETMORE, *U. S. National Museum, Washington, D. C.*

The authority for the name of the Long-tailed Chat.—Hellmayr (Cat. Birds Amer., 8: 447, 1935) has correctly shown that the name *Icteria virens auricollis* must supplant *I. v. longicauda* Lawrence as the name of the Long-tailed Chat. However, he gives Bonaparte as the authority, a procedure which is in error. As the present writer showed some years ago, the name should be credited to Lichtenstein and not to Bonaparte. Details of the citation in Lichtenstein will be found in 'Transactions' of the San Diego Society of Natural History, 7: 353–354, May 31, 1934. It may seem superfluous to repeat this citation but the frequent use of Bonaparte as the founder of the name *auricollis* by several recent authors has prompted the correction.—A. J. VAN ROSSEM, *Dickey Collections, California Institute of Technology, Pasadena, California.*

Southern Robin breeding in coastal South Carolina.—For several years there has been a noticeable extension in the range of the Southern Robin (*Turdus migratorius achrusterus*) from the Piedmont sections where it breeds abundantly, toward the coast region. It has passed the Fall Line which runs roughly, midway across the State, and a season or two ago, appeared as a nesting bird at Elloree, Orangeburg County, about seventy-five miles from the coast. This was the nearest breeding record to the coast yet known. During this past season, however, it has appeared almost on the coast itself.

On July 21, 1938, an adult was seen feeding young birds in the yard of Mrs. J. F. Bischoff of Summerville, South Carolina, a small town about twenty-five miles inland from Charleston. Mrs. Bischoff is a careful observer of birds, and she and her son watched the Robin feeding the young. Knowing its importance, she has communicated the record. This brings the bird virtually to the coast, certainly in the coastal strip, and extends the nesting range by nearly fifty miles from the previous seventy-five-mile distance from salt water.—ALEXANDER SPRUNT, JR., *National Assoc. Audubon Societies, Charleston, South Carolina.*

Alta Mira Oriole in Texas—an addition to the A. O. U. 'Check-list.'—During the course of field work in southeastern Texas early in January, 1938, I spent several days at Brownsville, and while there took advantage of the opportunity to acquire at least a slight familiarity with the winter bird-life of the lower Rio Grande Valley. Among the birds collected then was a female oriole that, because of its large size and rather vivid plumage, suggested at once a bird of tropical origin. This specimen was later examined by Dr. Harry C. Oberholser, of the U. S. Bureau of Biological Survey, Washington, D. C., and identified as the Alta Mira Oriole (*Icterus gularis tamaulipensis*), a bird ranging from Vera Cruz and Puebla to Tamaulipas,

and for which there is no previous record for the United States. The day it was collected, January 7, 1938, it was found feeding with a flock of Green Jays (*Xanthoura luxuosa glaucescens*) in rather thick woods a few miles north of Brownsville; it was restless and wary, and was approached only with difficulty.—Thomas D. Burleigh, *U. S. Bureau of Biological Survey, Gulfport, Mississippi.*

Summer Tanager in Nova Scotia.—Early in April, 1937, a report reached me from the west end of Wolfville to the effect that a "strange reddish bird" was seen about the home of my informant. Believing it to be nothing more unusual than a male Purple Finch, I dismissed the incident from my mind. On April 17, however, a similar report was received by telephone from the same vicinity and upon investigation I had the pleasure of seeing, for the first time, a beautiful male Summer Tanager (*Piranga rubra*) in life. I followed it about for half an hour or longer, as it flew leisurely from tree to tree, apparently in search of food. Its bright plumage stood out most vividly among the leafless branches and attracted the attention of a number of passers-by. On one occasion I saw it drop suddenly to the ground, where it pounced upon some large dark-colored beetle which it quickly carried to a limb upon the broad surface of which it was seen to peck viciously at its helpless victim. The bird stayed about that immediate locality for the remainder of the month, surviving a number of freezing nights and at least one snowfall of sufficient violence to leave the ground white for several days. This record is the third definite one for this species in Nova Scotia that my files contain. The others are: April 20, 1913, a male picked up dead in Yarmouth County; and October 10, 1929, a male picked up at Annapolis Royal in an emaciated condition. According to Mr. P. A. Taverner there are several old records for Nova Scotia scattered over many years, two of which were at Seal Island, Yarmouth County, prior to 1888.—R. W. Tufts, *Wolfville, Nova Scotia.*

Two apparently overlooked names for North American birds.—Because of their publication in a work on cagebirds (Russ, Karl, 'Die fremdländischen Stubenvögel,' 1: 710 pp., 14 col. pls., 1879) two names proposed for towhees (*Pipilo*) have apparently escaped attention of American systematists. One is *Fringilla scapularis* Russ new name for *Fringilla oregona* Bell (*Pipilo arctica* Audubon, not of Swainson). Of this Russ says, "Since in previous descriptions of finches both of these synonyms are to be found I am compelled to select another Latin name" (p. 481). The second new name is *Fringilla bairdi* Russ for *Pyrgita arctica* Swainson (*Pipilo arcticus* Baird). In this instance Russ explains, "As several of the Ammersperlingen [*Fringilla* in broad sense] bear the synonym *arctica*, I give this species a new Latin name. In quest of a designation, first the elder author, Swainson, was considered but a *Fringilla swainsoni* already existing, I went on to the second author, Baird."

Localities mentioned in connection with the names are: for *scapularis*, "the Oregon and Washington region" and for *bairdi* "high plains of the upper Missouri." The first of these names pertains to *Pipilo maculatus oregonus* Bell (1852) of the present A. O. U. 'Check-list' and the second to *Pipilo maculatus arcticus* Swainson (1831).

Russ's 'compulsion' for making the new names arose from his very comprehensive treatment of genera. As he included so many forms in the genus *Fringilla*, it was no wonder that a few apparent homonyms came to light. According to present practice his names are unnecessary. In the genus *Pipilo* they are well antedated for the subspecies to which they refer and are straight synonyms of the currently used names.

They call for no nomenclatorial changes, therefore, and happily may be regarded as innocuous.—W. L. McAtee, *U. S. Biological Survey, Washington, D. C.*

The Chipping Sparrow's song.—In a recent number of 'The Auk' (55: 125, 1938), Messrs. Brand and Axtell have questioned my statement that the song of the Chipping Sparrow (*Spizella passerina*) consists commonly of notes in multiples of eight. It seems worth while to put on record the data on which I based this statement. I have, at present, thirty-four records of the Chipping Sparrow's song. Five of these have notes too fast to count. Another is irregular, consisting of a short trill, followed by thirteen rather slow notes. The remainder are as follows: three are of eight notes, one is of twelve, one of fifteen, eight are of sixteen, two of seventeen, one is of eighteen, two are of twenty-two, one is of twenty-three, five are of twenty-four, one is of twenty-eight, two are of thirty-two and one is of fifty-two. From these data it was natural to conclude that eight, sixteen, twenty-four and thirty-two were the commoner numbers. As Messrs. Brand and Axtell surmise, the majority of my records are from southwestern Connecticut. But among my records are those of two birds at North Elba, New York, in the northern Adirondacks. One of these birds sang sometimes twenty-four and sometimes thirty-two notes. The other, rather curiously, sang just half as many, that is, sometimes twelve and sometimes sixteen.

Chipping Sparrows vary greatly in the rapidity of their notes, and the more rapid ones cannot be counted by ear. But I do not doubt the ability of an observer with a good ear to count the notes when they are not faster than ten to the second. I have one record that is only about six notes to the second, only slightly faster than the ticking of a watch. I have counted the notes in songs that were as fast as fifteen notes to the second, and I think the count was accurate.

While there is no doubt that Mr. Brand's machine-made records are more to be trusted than those made by ear, there will always be greater difficulty and expense in making such records, and to make any considerable number of a single species would probably prove prohibitive. By ear, it ought not to be difficult to obtain several hundred in a single season, from a large number of individual birds. While my thirty-four records do not compare with the one hundred and seventy-nine of Brand and Axtell, nevertheless theirs are from but twelve individuals, while mine are from twenty-eight. I have counted notes in the field a good many times, how many I cannot say, when I made no record; for the making of a record entails timing and taking the pitch as well as counting the notes. Another point that may influence the number of notes and the amount of variation in an individual, is the season of the year. Birds in general sing more regularly and normally in the height of the breeding season, and vary more as the season advances. The majority of my Chipping Sparrow records were made in April and May.

All of the eight-note songs I have heard from Chipping Sparrows have been sung in the very early morning, between daylight and sunrise. I believe that there is then a twilight song, in which the bird repeats its short songs rather rapidly for a time, and accents the first note of each song. I have heard this only a few times, however, and it deserves more careful study.

Whether my original statement about the multiples of eight is right or wrong, I believe the matter deserves more study. Many records from many individual birds in widely separated localities and at varied seasons of the year, ought to help settle the matter. In addition it would be worth while to learn how much the song may vary with changes in the nesting cycle.—Aretas A. Saunders, *Fairfield, Connecticut.*

Observations in Madison Parish, Louisiana.—The following observations, of birds unusual or interesting for that region, were made in Madison Parish, northeastern Louisiana, in a stand of virgin bottomlands timber. Sweet gum, four species of oak, green ash, and American elm are the dominant trees there. The observations were made by myself alone or with J. J. Kuhn of Tallulah, Louisiana, and were made in the following periods when I was in the area: March 22 to July 16, 1937; December 14 to 24, 1937; and February 17 to August 16, 1938.

Swallow-tailed Kite, *Elanoides forficatus*.—According to reports from the natives of the region, this kite once nested regularly in the tall timber. There has been no cutting of timber and no other apparent change to affect the birds, but they have not nested in the area in the last two years. The only record in this time is of one bird seen by me on April 2, 1937.

Golden Eagle, *Aquila chrysaëtos canadensis*.—An immature Golden Eagle, apparently a year-old bird judging from the large amount of white on the tail, was seen by J. J. Kuhn and myself on March 6, 1938; probably the same individual was seen again by myself on March 12, 1938, about three miles from the place where it was first seen.

Wild Turkey, *Meleagris gallopavo silvestris*.—Turkeys are more abundant here than anywhere else I have been in the Mississippi Delta region; one flock of about sixty birds was seen by J. J. Kuhn and myself on December 21, 1937.

Blue-headed Vireo, *Vireo solitarius*.—This vireo was present although scarce, and singing, in December, 1937.

Bachman's Warbler, *Vermivora bachmani*.—A male of this warbler remained near one place at the meeting of tall woods and cut-over land and sang regularly from May 25 until at least June 3, 1937. No female was there, and not one of this species was seen in 1938.—James T. Tanner, *Laboratory of Ornithology, Cornell University, Ithaca, New York.*

RECENT LITERATURE

Wilder and Hubbard's 'Birds of Northeastern China.'—This[1] is an attempt to popularize bird study in China. It deals particularly with the avifauna of Hopei Province (formerly Chihli), but it probably applies equally well to the adjoining provinces of this part of China. Three hundred of the forms that are treated more or less fully, are of established occurrence and one hundred and forty-five which are accidental or of doubtful status are given in footnotes. After a number of pages of text, explaining the object of the book, use of the keys, geography of the region, etc., keys to the orders and families are given, followed by keys to the species. Then the systematic treatment of the species is commenced, starting with the crows and ending with the pheasants. Under each family a few pertinent characters are given. The species are then taken up and brief descriptions given, mostly confined to field-marks; measurements are rarely given. Notes on the habits, calls, nest and eggs, and distribution are briefly given under each form and are one of the most valuable features of the book, as they are mostly founded upon personal observation during many years' residence in the country. The book is embellished with many wood-cuts, more or less crude, but sufficiently accurate in most cases to be of assistance in identification. Following Hartert, the authors unite the Sylviidae, Turdidae, Timaliidae, and Muscicapidae under the latter name. This makes a bulky and unwieldy assemblage of heterogeneous elements and is a retrograde step in classification. The form, *Pterorhinus davidi davidi*, is placed in *Garrulax*, which is certainly no improvement. The modern tendency to combine genera is a step backward and does not have the reviewer's sympathy. The Curlew Stint (p. 538) is placed in *Calidris;* this is probably a slip, as the Knot is also and correctly placed in this genus on p. 545. In my opinion Mathews was justified in erecting the genus *Ateliotringa* for *Totanus tenuirostris* Horsfield. These are minor matters, however. The chief criticism of the work as a field-book is its bulk; the same matter could have been more condensed at a great saving, which would have made it more convenient to carry. For the audience it was designed to meet, this is an excellent book and it is to be hoped will meet with great success. The authors are to be congratulated upon being able to produce it in a war-torn country.—J. H. Riley.

Oberholser's 'Bird Life of Louisiana.'—This[2] latest of 'State lists' is the result of a cooperative enterprise undertaken jointly by the Department of Conservation of the State of Louisiana and the U. S. Bureau of Biological Survey. It consists of a brief introduction, a short chapter on migration, a calendar of bird migration in the State and a few pages on the protection of birds, these sections totalling only about twenty-three pages. The annotated list deals with 429 forms plus a hypothetical list of twenty-two and covers over 650 pages, while a comprehensive bibliography of 477 titles, together with an unusually complete index occupies the balance of the volume.

The annotated list is of course the chief reason for the publication of the volume, and as such deserves especial notice. The treatment for each form of regular occur-

[1] Birds of Northeastern China. A practical guide based on studies made chiefly in Hopei Province. By George D. Wilder and Hugh W. Hubbard. Illustrated mainly by Li Chu-nung, Richard Mather, and Gertrude S. Wilder. Published by the Peking Natural History Bulletin, 12mo, v + 700 pp.; many wood cuts, 2 maps, April 1938. Price, $7.50 local currency (in foreign countries $1.50 more).

[2] Oberholser, Harry C. The Bird Life of Louisiana. Bull. no. 28, Department of Conservation, State of Louisiana, New Orleans, 8vo, pp. i-xii, 1--834, 45 pls., June, 1938.

rence is virtually the same: a brief statement of the status of the bird, its haunts, habits, field-marks, migration and nesting dates and then, the most valuable feature of the entire list, the detailed distribution throughout the State based on the examination of all available specimens collected in the State, and reports of occurrence based on literature and on the hitherto unpublished records by numerous correspondents, the author's personal observations and the material in the files of the Biological Survey. Certain species are added to the avifauna of the State on the basis of sight records; in the reviewer's opinion such species are better placed on the hypothetical list until substantiated by specimens.

It would have been better, in preparing this list of Louisiana birds had the author confined himself to the more conventional type of 'State list' following the nomenclature adopted by the fourth edition of the A. O. U. 'Check-list,' instead of adopting a number of generic subdivisions rejected by the Check-list Committee. Further, such a list hardly seems to be the proper place for describing new subspecies, or for reconstituting old ones that have not hitherto been deemed worthy of recognition. No less than five new races are proposed by Dr. Oberholser in this volume as follows:—

Sterna forsteri litoricola (p. 290), type from Smith's Island, Virginia, breeding along the Atlantic and Gulf coasts from Virginia to Texas.

Pentheates carolinensis guilloti (p. 425), type from Belair, Louisiana, inhabits the lower Mississippi Valley region in the central-southern United States.

Molothrus ater buphilus (p. 611), type from Marsh Island, Louisiana; distribution, central-southern United States west to New Mexico and central-western Texas and south to northeastern Mexico.

Pipilo erythrophthalmus leptoleucus (p. 641), type from New Orleans, Louisiana; distribution, southeastern and central-southern Louisiana.

Melospiza georgiana ericrypta (p. 675), type from Fort McMurray, Alberta; distribution, breeds from Alberta and Manitoba to North Dakota, winters south to Tamaulipas, Louisiana and Florida.

Of the long-disused subspecific names, the following have been resurrected, and in many instances the evidence in support is too insufficient to be convincing:—*Charadrius melodus circumcinctus* (Ridgway), *Larus atricilla megaloptera* Bruch, *Sphyrapicus varius atrothorax* (Lesson), *Riparia riparia maximiliani* (Stejneger), *Toxostoma rufa longicauda* (Baird), *Hylocichla ustulata almae* Oberholser, *Setophaga ruticilla tricolora* (P. L. S. Müller), and *Peucaea aestivalis illinoensis* Ridgway.

The concluding paragraph of the foreword by Mr. William G. Rankin, Commissioner of Conservation, expresses the hope that "these [the plural referring to a supplemental bulletin now in preparation] will serve to aid the efforts of teachers everywhere throughout the State in educating students to a richer appreciation of the aesthetic beauty and practical value of our birds as an important part of our wild life." In the reviewer's opinion this volume is too technical to serve this purpose; rather it will prove of more value to the taxonomist and student of distribution.—J. L. Peters.

Anker on 'Bird Books and Bird Art.'—It is significant of the almost universal interest in birds, that the University of Copenhagen, wishing to mark by some worthy memorial the completion of a new modern building for its great library on natural sciences and medicine, should have decided to issue in commemoration of that happy event, this splendid volume[1] on the history of ornithology with special refer-

[1] **Anker, Jean. Bird Books and | Bird Art | An outline | of the literary history and iconography of | descriptive ornithology | etc. 4to, xviii + 251 pp., 14 pls., 1938; Levin and Munksgaard, Norregarde 6, Copenhagen. Price 42 kr. in paper, 48 kr. bound.**

ence to its iconography. For the development of ornithology has closely paralleled our cultural advance. While the historical development of ornithological science is not a new subject, it has perhaps never before been treated so inclusively as in the present account, which emphasizes especially the use of illustrations to supplement, or, as in some early works, even to supplant verbal description. The text is divided into two main sections, the first of which is devoted to the narrative, while the second is mainly a bibliography of the works containing illustrations of birds, to be found in the University's library.

The history of ornithology and of the iconography of birds is treated in seven chapters. The first of these very briefly considers the few remains of carvings or outlines that have come down to us from the Stone Age, with a brief paragraph only on the many bird paintings to be found in the tombs and temples of ancient Egypt. No mention is made of the many fine figures of birds by American aborigines, such as those of the Maya codices. The beginnings of ornithology as found in the works of Aristotle and Pliny formed the basis of European knowledge of birds in the Middle Ages, while in addition many excellent figures are known in certain manuscripts of those times of which the author has something to say. Shortly after the art of printing had been invented, there followed a period when the making of woodcuts was highly developed, with the use of woodcuts in books so that the illustrations could be printed with the type matter. The year 1555 marked the inception of a new era in natural history, with the publication of the works of Bélon, Gesner and Olaus Magnus, all in the same year and we are given many interesting details of the artists and authors of these and preceding years. There followed the period of engraver's art, giving us the first works with plates engraved on copper, later on stone, and either plain or hand-colored, or still later with printed colors. A milestone on this road of progress was the 'Ornithologiae libri tres' by Willughby and Ray, almost the first of the works of a scientific nature on birds, with perhaps the exception of Bélon's. The last third of the eighteenth century was marked by the great works of Buffon, the 'Planches enluminées,' and the 'Histoire Naturelle,' which were received with such universal favor that "even ladies found amusement" in them. This, too, was the period of great exploring voyages with their beautifully illustrated reports prepared by various naturalists, and of many encyclopedic works that assembled descriptive accounts of the known birds. The first half of the nineteenth century was notable for its many magnificent folio works illustrating birds, such as those of Audubon, Gould, and Levaillant, works of such unwieldy size and such great cost that it became a question if they really aided scientific progress. Finally, the author passes in review country by country, many of the main contributions to ornithology made by each, bringing the subject to the present time. He believes, and no doubt rightly, that photographs of birds, in spite of their modern perfection, can never wholly replace the work of the bird artist, whose hand and eye combine to give the charm of a personal touch.

The second half of the book contains an annotated bibliography of works on birds that contain illustrative material apart from photographic, and are to be found in the University Library of Copenhagen. Of these there are over five hundred titles, with as many more in a second part of the list, of general works, especially those relating to the history of art and its bearing on ornithology, concluding with an index of authors and artists, fifteen pages in double column, with the addition of the dates of birth and death of the various persons, the compilation of which must in itself have been an immense task.

The book is handsomely printed, the text in double column to facilitate reading on

account of the size of the page. Twelve of the plates are reproduced from the works of selected authors to illustrate the progress of ornithological art, from the woodcut period beginning with von Megenberg's 'Buch der Natur' (1475), through the hand-colored engraving era of Edwards and Catesby, to the more modern colored lithograph and offset. It is a matter of satisfaction that the last of this series should be one of the plates by Fuertes of the Nile Helmet Shrike, illustrative of work that ranks high and loses little in comparison with that of Gould or of Thorburn. Two additional plates show, as frontispiece, paintings of three species of dead birds contributed by Johannes Larsen, a modern Danish artist; and (the second) a reproduction of an Egyptian tomb-painting of the Red-backed Shrike, remarkable for its faithfulness to details combined with Egyptian artistic restrictions. The text, originally written in Danish, has been beautifully translated into English, and there are very few typographical errors, so that its important historical matter is thus readily available to a wide circle of English-speaking people. The author and sponsors of the work may well feel satisfaction in having produced a book in every way worthy of the event it commemorates.—G. M. Allen.

Bent's 'Life Histories of the Birds of Prey,' Part 2, concludes the treatment of the raptorial birds of North America north of Mexico, taking in the falcons and caracaras and all the owls. It forms the eleventh volume[1] in this well-known series and fully maintains the excellent standard of the previous parts. The method follows that of the other volumes, giving for each species a general account of the habits (haunts, courtship, nesting, eggs, food, behavior, and voice), a brief description of plumages, the detailed distribution in summer and winter, and egg dates. In the case of subspecies, the account gives only such points wherein they are found to differ characteristically from those of the form first described. In all, eighteen species and races of falcons and two species of caracaras are considered, as well as fifty of owls. Of these only one, the caracara of Guadeloupe Island, is extinct, having been wiped out about 1900 by herders, whose young goats it preyed upon. As before, the greater part of the authorship rests upon Mr. Bent, who possesses a happy faculty for presenting in few and well-chosen words the outstanding characteristics of the habits and haunts of each bird, and for weaving into a coherent whole the vast amount of notes gleaned from literature, or contributed by many correspondents, or drawn from his own wide experience in the field. Of European species that just come within the North American area, the accounts of the Peregrine Falcon and the Kestrel are contributed by Rev. F. C. R. Jourdain; those of the Short-eared Owl and Richardson's Owl were prepared by the late Dr. Charles W. Townsend; that of the Eastern Sparrow Hawk by Dr. Winsor M. Tyler; while the excellent life history of the Prairie Falcon and those of eight other western species are the work of Milton P. Skinner. The ninety-two plates illustrating this part are from photographs of a high order of excellence and show the varied nest sites, the eggs and nests, the young stages and adults of six species or races of the Falconidae and twenty-six of owls. Some of these birds are very fully illustrated; thus there are six plates of the Prairie Falcon, five of the Duck Hawk, eight of Great Horned Owls, seven of Barred Owls, five each of the Barn Owl and the Snowy Owl. The total amount of time and effort involved in securing these series, contributed by various persons, must add up to a large whole, and is a good example of the cooperative nature of the work.

With the volumes on hawks and owls now complete, it is natural to compare the

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[1] Bent, Arthur Cleveland. Life Histories of | North American Birds of Prey | (Part 2) | Orders Falconiformes and Strigiformes | Bull. U. S. Nat. Mus., no. 170, viii + 482 pp., 92 pls., 1938. For sale by the Superintendent of Documents, Washington, D. C., price 60 cents.

accounts with those of Bendire in the original 'Life Histories' of 1892. In this, one cannot fail to be struck by the vast amount of new matter that has accumulated in the meanwhile, so that the present work is much more nearly a monographic treatment than was possible in Bendire's day. The great advances made in photography and the many devotees to that branch of ornithology have also rendered possible now the permanent preservation in pictorial form, of the life appearances of a multitude of species that was quite out of the question in 1892.

While lack of space forbids extensive quotation from the present volume, it may be pointed out that Mr. Bent in reviewing the western races of Great Horned Owl, quotes Dr. L. B. Bishop as saying that the race named by Dr. Oberholser as *icelus*, though not recognized by the A. O. U. 'Check-list,' is perfectly valid. He has in his collection a series of over twenty specimens and regards it as the breeding bird from Tillamook County, Washington, south in the coastal area to Monterey, California.

The wealth of useful and detailed information, well arranged and sifted from all available sources, makes this series of bulletins a standard work of reference on the general biology of North American birds.—G. M. Allen.

Chapman's 'Life in an Air Castle.'—A new book from Dr. Chapman's facile pen is always an event. The present volume[1] telling of further studies and experience at Barro Colorado Island forms a sequel to his earlier book, 'My Tropical Air Castle' (1931), and is the outcome of later winters spent at this ideally situated observatory in the American tropics. Here, as nowhere else in this hemisphere, the naturalist finds himself comfortably situated in the midst of a luxuriant forest with its undisturbed wildlife literally at his doors, to be studied at leisure.

The opening chapter finds the author once more on a steamer bound for Panama, and prepares the way for the reader's arrival at the Laboratory. Succeeding chapters picture the familiar birds and mammals to be seen from the balcony of his 'air castle,' with more extended accounts of some of the species of particular interest, the trogons, tanagers, toucans, and night birds. The account of the Turkey Buzzards throws new light on the migratory habits of these great birds, which, drawn evidently from some northern localities, pass semiannually to and from a more southerly wintering area, here suggested as the savanna region of the Orinoco. Experiments are described which were designed to throw some light on the sense of smell in these birds, but certain conclusions seem difficult to make. An entire chapter is devoted to the social habits of the Smooth-billed Ani, another to the remarkable mating procedure of Gould's Manakin, while others deal with the monkeys, the versatile coatis, the peccaries, and shyer forest animals. A final word sums up the past history of Barro Colorado and something of the work of the Laboratory since its foundation fifteen years ago, with a bibliography of special investigations published concerning its flora and fauna. An appendix gives a useful list of the birds hitherto ascertained to occur on the island, with very brief annotations.

Although several of the chapters have previously appeared elsewhere, so that much of the more important studies are not here told for the first time, there is nevertheless a great deal that is new, while some of the more detailed accounts, such as that of the Gould's Manakin, are partly re-written in adaptation to the needs of a popular book. The thirty-one plates are from excellent photographs, mostly taken by the author; while chapter-headings from pen-and-ink sketches by Jaques are an attractive addition.

There is a need for works of this kind, that shall picture for the reading public in

[1] Chapman, Frank M. Life in an Air Castle. 8vo, xii + 250 pp., 31 pls., 1938; D. Appleton-Century Co., New York. $3.00.

attractive form some of the results of a naturalist's studies, and thus vividly convey some conception of the abundant and remarkable life of the stable tropics so unfamiliar to those of the north-temperate zone. In presenting this sequel to his previous volume, Dr. Chapman once more makes a welcome contribution to our knowledge of living birds and mammals. Most of us build air castles; but Dr. Chapman puts foundations under his.—G. M. ALLEN.

Horton-Smith's 'Flight of Birds.'—Ever since men began to fly they have been steadily acquiring a clearer knowledge of the flight of birds, and of the mechanics, adjustments, limitations and hazards of this method of locomotion. "It is highly desirable," writes Sir Gilbert Walker in his foreword to this little volume,[1] "that from time to time the understanding based on this information should be presented" in form suitable for readers unfamiliar with the complex technicalities of the subject. With this laudable purpose the author here sets forth a short account of the history of man's attempts to study and imitate the flight of birds with especially a review of the development of this mode of progress in birds, their various types of flight, the mechanical factors involved, and some of the special adaptations of the wing under various conditions of environment. Probably the first to study and formulate some of the principles of bird flight was that remarkable Florentine, Leonardo da Vinci, whose treatise on the subject was published in 1505.

At the present day sustained soaring flight has been successfully imitated by human gliders. In tracing the evolution of bird flight one may disagree with the author that the ancestors of birds were dinosaurs, that enlarged scales on the fore limbs provided their first support in the air, or that fore-limb membranes "laid the foundation" for future wings. If Archæopteryx, with its primitive style of wing, was capable only of "fluttering flights" or "prolonged glides," it might have been emphasized that its flight feathers seem to have consisted of small weak secondaries only, so that rowing flight may not have been developed at that stage at all. The structure of modern birds' wings, the correlation of wing form with types of flight and habitat and a discussion of the action of the wings in relation to the air medium form the subject of six of the eight chapters, while the two remaining deal with velocity and safety devices. The author divides soaring birds into two categories according to the relative altitudes at which this action takes place. The high soarers, like eagles, are broad-winged and make use chiefly of ascending convectional currents of air, hence are mostly land birds, whereas the low soarers like albatrosses and gulls, have long narrow wings and make use of the "variations of the wind" as currents flowing in general parallel to the earth's surface. This division, while instructive and interesting, may have its exceptions, while such a bird as the Herring Gull may soar in both types of air currents. The chapter on velocity of flight points out the common faults in estimating this speed through the usual disregard of the essential conditions of wind direction and wind velocity as affecting the speed of the bird and provides a simple means of making approximately correct calculations by plotting to a given scale the observed course, distance and wind velocity, the last to be determined through use of the Beaufort scale, which is reproduced. Examples are given showing how from simple observations of these factors the true speed may be worked out. The final chapter contains much that is interesting in explanation of the meaning of the wing slits produced by emarginated primaries in stabilization of flight while soaring. Finally there is a glossary as well as a short bibliography which might have been much more helpful if dates, pages and place of publication had been uniformly

[1] Horton-Smith, C. The flight of birds. Small 8vo, 182 pp., 17 pls., 30 text-figs., 1938; H. F. & G. Witherby, Ltd., 326 High Holborn, London, W. C. 1. Price 7*s*. 6*d* net.

given. Although many questions remain unanswered, the book forms an interesting exposition of the general subject which will be of value to anyone interested in making further (and needed) observations on flight and speed. It is especially commendable for its simple treatment of a complicated matter, with the addition of results derived from recently developed knowledge of aërodynamics.—G. M. ALLEN.

Allee's 'Social Life of Animals.'—It is only of recent years that we have begun the more careful study of the social relations of animals. Such relations have been variously defined but at least have their beginning when 'the behavior of one individual affects that of another'; while with further development groups and aggregations may show increasing complexity of individual and collective interdependence, leading in some cases, as in ants, bees and some vertebrates to a social organization involving intricate adaptations. The volume[1] here noticed grew out of the author's course of Norman Wait Harris lectures given at Northwestern University and presents in brief and readable style a summary of his own and other studies on certain social animals, particularly some of the invertebrates. It traces the beginnings of cooperation, the formation of aggregations brought about through some common stimulus or advantage, the behavior of groups as units, and simple or complex organization within the groups. That there are often advantages of survival value in group formations is pointed out even in the case of flatworms, certain species of which, if isolated and exposed to ultra-violet light soon die, but if in groups, crowd together so that the upper protect the lower ones, prolonging the lives of the latter.

The portions of the work dealing with birds are necessarily limited and do not nearly cover the subject. It is clearly apparent that only a beginning has been made in careful study of individual species. Thus the author points out that the social hierarchy or 'peck-order' established by Schjelderup-Ebbe among groups of domesticated hens proves to be of a different nature in doves and parrots, or even in different groups of hens, while continued research will doubtless show further variations among other species. Nor has it been possible to extend the investigation very far as yet among birds in a wild state. Nevertheless it might have been suggested that the spacing out of certain species in the breeding season is perhaps but a manifestation of a similar instinct. Very little mention is made of the work of other recent students of avian sociology as of Heinroth in Germany, Lorenz in Austria, Noble and Mrs. Nice in this country, but after all the sociology of birds demands a volume in itself.

The implications of the study of social behavior in lower animals as applied to the human species are set forth in a later chapter of the book with much that is interesting and entertaining. While the author warns that we must be cautious in the distinction between analogy and homology, he inclines to the view that many of the more complex relations may have developed in different lines of descent from common basic origins.

The book is well printed and attractive to hand and eye, is well indexed and contains a useful bibliography. It forms a suggestive and illuminating review of certain aspects of the modern study of animal sociology that should be of wide interest not only to biologists but to the general reader as well.—G. M. ALLEN.

Commons's 'Log of Tanager Hill.'—Since most of the published matter on bird-banding is in the form of pamphlets or short articles in journals, this book[2] recounting the author's adventures in this field comes as a welcome addition to the

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[1] Allee, W. C. The | Social | Life | of Animals. 8vo, 293 pp., 49 text-figs., 1938; W. W. Norton & Co., Inc., New York City. Price $3.00.

[2] Commons, Marie Andrews. The Log | of | Tanager Hill. 8vo, xvii + 244 pp., illustr., map; Williams & Wilkins Co., Baltimore, Maryland. $2.50.

literature of the subject. Tanager Hill is the country estate overlooking beautiful Lake Minnetonka in Minnesota, where Mr. and Mrs. Commons spent their summers. Their especial interest in banding was aroused through listening to a presentation of the subject at a meeting of the A. O. U. at Chicago in 1922. Inspired by the thought of a closer intimacy with birds in this way, they commenced in the following spring to trap and band birds on their estate and found it a most absorbing occupation. The fascination of handling and knowing individually the birds thus marked gave a wholly new insight into the personalities of these visitors; and when in succeeding years the summer resident birds returned wearing their bands they seemed like old friends come back. The work was continued with meticulous care in handling the birds and in keeping the records until the death of Mr. Commons after eight years.

An introduction by Frederick C. Lincoln and a Foreword by Dr. Thomas S. Roberts, precede the author's account of the activities at Tanager Hill. An entire chapter is devoted to each of the eight years, and if the recital of the birds banded from day to day or from week to week becomes a trifle dull at times, one may gather nevertheless something of the author's enthusiasm and sense her keen interest in the changing moods of the seasons and their accompanying phenomena. During the eight years, a total of over eighteen thousand birds was banded, of which some 626 returned in following years, or about three and a half per cent. The two final chapters summarize the main results of the eight years of banding. Here a number of interesting facts are brought out. The local Western Mourning Doves winter in Texas as shown by four recoveries; several recoveries of Robins showed that the birds had gone to Louisiana, Alabama, Arkansas and even Mexico to winter; Giant Red-wings went to Louisiana and Texas; while Juncos, banded in October during migration, turned up in later winters in such scattered localities as New Jersey, Arkansas and Illinois. The summary tables show that by far the greater number of the many returns occurred in the year following banding, much fewer in the second year, while the number of banded birds that returned to the place of banding for a third or a fourth year was very small indeed. One Chipping Sparrow, however, returned to nest at Tanager Hill for five consecutive years.

The volume is really a memorial to the author's husband, Frank Watkins Commons, whose keen interest in the banding operations was the inspiration of her own. In it the author has with a measure of success imparted to her readers her own sympathetic delight in birds and natural beauty. Barring occasional misprints, the volume is attractive in appearance and contains much of interest to bird-banders as well as many facts of permanent value in the study of bird migration. The frontispiece is a portrait of the late Mr. Commons, and there are other illustrations many of them loaned by the U. S. Biological Survey, that enliven the text. Here is an excellent example of what may be done by amateurs in bird study to enrich our detailed knowledge of the habits of birds.—G. M. Allen.

Van Tyne's 'Check List of the Birds of Michigan.'—This is the first time since W. B. Barrows published his 'Michigan Bird Life' in 1912 that a complete checklist of the birds of Michigan has been made available. Dr. Van Tyne has listed 328 forms, 199 of which have known breeding records. Besides the common and the scientific name of each form, the status, so far as it is known, and the general range are given. Naturally in twenty-six years' time a great deal has been learned about the birds of Michigan. An increase in the number of competent observers has aided materially, although there are some regions not yet covered at all regularly.

To the average observer this new list[1] is full of surprises, although some were sus-

[1] Van Tyne, Josselyn. Check List of the Birds of Michigan. Occas. Papers Mus. Zool., Univ. of Michigan, no. 379, 44 pp., June 16, 1938. 25 cents.

pected by the more profound students. For example, the Ohio House Wren is the common form in most of the Lower Peninsula, the Western House Wren is found in the Upper Peninsula, while only one, an old record, is known for the Eastern House Wren in the State. Likewise we have the Mississippi Song Sparrow below the Straights, and the Dakota form for most of the area above. The Lesser Loon is the type found here, as is the Western Henslow's Sparrow. More confusing to the novice is the fact that the Veery is a common migrant, and the Willow Thrush is the breeding bird, and that the similar Grinnell's and Northern Water-Thrushes are both summer residents.

At the time Barrows published his book the Starling had not yet invaded the State; the Cardinal, which has now been taken in the Upper Peninsula, was to be found only in the southernmost three tiers of counties, although it occurred sparingly farther north. The Tufted Titmouse, now ranging at least to Charlevoix, was rare even in the most southern counties. Likewise the Western Meadowlark, which had been taken but once prior to 1912, is now common in the western part of the Upper Peninsula, and singing males have been found over much of the rest of the State. A recent addition is the Arkansas Kingbird which, although still very rare, has nested at least once (1937). Many of the other additions are based on single records. Some, such as the Yellow-throated Vireo, a rare summer resident, return persistently to certain areas where they are thought by residents there to be common.

This summary of the status of our species is of great help to the Michigan observers. —Margaret E. Gross.

Periodical Literature

Ansbacher, S. New observations on the vitamin K deficiency of the chick. Science, n.s., **88**: 221, Sept. 2, 1938.—This vitamin administered to chicks deficient in it, will shorten the blood-clotting time.

Ball, Stanley C. Summer birds of the Forillon, Gaspé County, Quebec. Canadian Field-Nat., **52**: 95–103, map, Oct. 1938.

Bartels, Max, Jr. Zwei neue Drosseln aus Java. Ornith. Monatsber., **46**: 113–115, July 27, 1938.—New are *Turdus javanicus stresemanni* and *Geocichla citrina orientis*.

Bates, G. L. On birds from Hadhramaut. Ibis, (14) **2**: 437–462, pl. 8, map, July 1938.—Discusses extent of Ethiopian Region along Gulf of Aden, and lists three recent collections of Arabian birds.

Baumgartner, Marguerite H. A plea for hawks. Jack-pine Warbler, **16**: 8–10, July 1938.—Hawk migration along shores of Lake Michigan and at Hawk Mountain.

Baxter, Evelyn V., and Rintoul, Leonora J. Notes on the status of birds in Scotland in 1937. Scottish Nat., no. 230, pp. 47–51, 1938.

Beard, Daniel B. The 1938 count of Noddy and Sooty Terns at the Dry Tortugas. Florida Naturalist, new ser., **12**: 7–10, Oct. 1938.—The numbers of the Noddy have decreased to hardly more than four hundred birds.

Behle, William H. Highlights of ornithological work in Utah. Condor, **40**: 165–173, July 15, 1938.—Historical account of ornithology in Utah.

Berlioz, J. Les collections ornithologiques du Muséum de Paris. L'Oiseau et Rev. Française d' Ornith., new ser., **8**: 237–260, 1938.—A short account of the history and collections of the great Paris Museum, rich in historic specimens. This institution, which recently celebrated its tercentenary, was originally a botanical garden, but its scientific collections of birds began about the middle of the eighteenth

century. Here was the repository for the spoils of the great exploring voyages. It is unfortunate that many of its types and historic specimens are mounted.

BEYER, LEONARD K. Nest life of the Bank Swallow. Wilson Bull., **50**: 122–137, text-fig. 20–21, June 1938.

BIRD, SIDNEY. Notes on little known eggs. Oologist, **55**: 74–76, July 1938.—Descriptions of various eggs laid by rarer birds in a California aviary. An embryo removed from an Emu's egg showed "a very conspicuous keel" on the sternum, absent in the adult.

BISHOP, LOUIS B. Correct names for the Red-backed Sandpiper and Northern Long-billed Curlew. Condor, **40**: 225–226, Sept. 15, 1938.—The former should be known as *Pelidna alpina pacifica* (Coues), the latter as *Numenius americanus parvus* (Bishop), as previously shown.

BOURDELLE, E. Les recherches sur la migration des oiseaux par le baguage et leur organisation en France. L'Oiseau et Rev. Française d'Ornith., new ser., **8**: 350–359, 1938.—An account of the work of the Service de Recherches sur la Migration des Oiseaux, carried on during the last seven years at the Paris Museum.

BRAUND, FRANK W. Nesting records for Ohio birds—Jan. 8, 1937 to Sept. 1, 1937. Oologist, **55**: 81–83, July 1938.

BRODKORB, PIERCE. Five new birds from the Paraguayan Chaco. Occas. Papers Mus. Zool., Univ. Michigan, no. 367, 5 pp., Apl. 5, 1938.—New forms are: *Rhea americana araneipes*, *Nandayus nenday campicola*, *Asthenes baeri chacoensis*, *Thraupis bonariensis schulzei*, and *Coryphospingus cucullatus fargoi*.

BRODKORB, PIERCE. New birds from the district of Soconusco, Chiapas. Occas. Papers Mus. Zool., Univ. Michigan, no. 369, 7 pp., Apl. 11, 1938.—New are: *Chaetura nubicola*, *Hylomanes momotula chiapensis*, *Lepidocolaptes souleyetti matudae*, *Thamnophilus doliatus crepitans*, *Catharus dryas ovandensis*, *Cyanerpes cyaneus striatipectus*, *Tanagra affinis esperanzae*, *Melozone biarcuatum hartwegi*, and *M. occipitalis grandis*.

BRODKORB, PIERCE. A new species of Crested Tinamou from Paraguay. Occas. Papers Mus. Zool., Univ. Michigan, no. 382, 4 pp., June 20, 1938.—*Eudromia mira* from Puerto Pinasco.

BROOKS, MAURICE. Bachman's Sparrow in the north-central portion of its range. Wilson Bull., **50**: 86–109, June 1938.—Habits and status in Ohio, West Virginia and southwestern Pennsylvania. "Evidence is presented to show that this species invaded the territory under consideration from the south or southwest during the latter years of the nineteenth and early years of the twentieth centuries."

BROOKS, MAURICE. The Eastern Lark Sparrow in the upper Ohio Valley. The Cardinal, **4**: 181–200, 1 pl., map, July 1938.—The bird has invaded many parts of this area from the west and southwest, but has somewhat decreased again in recent years.

BRYANT, C. E. Photographing the Hoary-headed Grebe. Emu, **38**: 15–17, pls. 7–8, July 1, 1938.—Nesting habits near Melbourne, South Australia.

CASAL, J. S. La cria de la Perdiz colorada (*Rynchotus rufescens*). El Hornero, **7**: 22–24, text-fig., Aug. 1938.—Breeding in captivity may be easily managed.

CERNY, WALTER. Sur la position systématique des bouvreuils *Pyrrhula pyrrhula* de Tchécoslovaquie avec quelques notes sur la variabilité de cette espèce. Alauda, (3) **10**: 76–90, 1938.—Notes on variation, especially of wing length, of the Bullfinch in Czechoslovakia.

CHAVIGNY, J. DE, AND LE DÛ, R. Note sur l'adaptation des oeufs du Coucou de l'Afrique du Nord, *Cuculus canorus bangsi* Oberholser, suivie de quelques observa-

tions biologiques. Alauda, (3) **10**: 91–115, 1938.—Habits and hosts in region of Tebessa. An egg in the nest hole of *Diplotocus* the authors believe must have been placed by the cuckoo taking it in her bill, as it seemed impossible for the bird to enter.

COLE, RANDALL K. Vitamin E and avian neurolymphomatosis. Science, **88**: 286–287, Sept. 23, 1938.—Thirty-one fowls suffering from fowl paralysis failed to recover when treated with wheat-germ oil, contrary to results previously reported.

CONDON, H. T. The birds of Reevesby Island, Sir Joseph Banks group. South Australian Ornithologist, **14**: 187–192, July 1, 1938.

CRABB, WILFRED D. Fall records of Golden Plover in Iowa. Wilson Bull., **50**: 139, June 1938.—Report of flocks of "from twenty to two hundred" from Woodbury County. One bird was killed.

DANFORTH, CHARLES H. Some feeding habits of the Red-breasted Sapsucker. Condor, **40**: 219–224, text-fig. 60, Sept. 15, 1938.—The bird follows a cycle in utilizing sap trees which flower or bud in sequence. In late summer and autumn insects and cambium augment the regular diet of sap.

DANFORTH, STUART T. Observations on some Barbadian birds. Journ. Barbados Mus. and Hist. Soc., **5**: 119–129, Apl. 30, 1938.—Maintains the distinctness of the Barbadian *Elaenia*.

DELACOUR, J. Les collections ornithologiques de Clères. L'Oiseau et Rev. Française d'Ornith., new ser., **8**: 219–227, 3 pls., 1938.—An account of the author's aviaries in France. One of the plates shows in colors the Imperial Pheasant (*Hierophasis imperialis*) discovered in Annam in 1923 and described by the author who brought the first known living pair to France. No other wild examples have since been taken, but the progeny of the original pair has supplied various museums with specimens. The male of this pair is still alive and in breeding condition after sixteen years.

DEWAR, J. M. The Dipper walking under water. British Birds, **32**: 103–106, Sept. 1, 1938.—The explanation of the bird's ability to walk on the bottom is that in facing the current the fore part of the body is inclined downward, so that the force of the water against its back keeps it down unless the current carries it off its feet.

DEIGNAN, H. G. A new subspecies of the European nuthatch from North Siam. Journ. Washington Acad. Sci., **28**: 371–372, Aug. 15, 1938.—*Sitta europaea delacouri*, from summit of Doi Suthep, northern Siam, Chiengmai province.

DIXON, JOSEPH. Birds & mammals of Mount McKinley National Park, Alaska. Fauna of the Nat. Parks of U. S., Fauna Series, no. 3, 236 pp., illustr., 1938.—Of the birds listed there are given description, distribution and many notes on habits within the Park, often with illustrations from excellent photographs.

DINELLI, LUIS M. La proteccion de las aves. El Hornero, **7**: 34–40, Aug. 1938.—Conclusion of article on bird protection in Argentina.

D'OMBRAIN, A. F. Destruction of birds by hail. Emu, **38**: 59, pl. 25, July 1, 1938.—The photograph shows a mass of hail in the Mailland district, New South Wales, as a result of a storm which was disastrous to many birds.

DONCASTER, C. C., AND DUNSHEATH, M. H. Some observations on nuthatches at the nest. British Birds, **32**: 136–137, fig., Oct. 1, 1938.—In Reading, England.

DUNAJEWSKI, — . [A new flycatcher from Algeria.] Bull. British Ornith. Club, **58**: 148, July 13, 1938.—*Muscicapa striata berliozi*.

ELLIOTT, A. J. Birds of the Moonie River district adjacent to the border of New South Wales with Queensland. Emu, **38**: 30–49, pls. 9–23, July 1, 1938.—With many excellent photographs of nesting birds. The author notes a curious associa-

tion of the Zebra Finch with the Brown Hawk (*Falco berigora*) into a nest of which or near at hand a number of the finches had built their nests.

ERRINGTON, PAUL L., AND BRECKENRIDGE, W. J. Food habits of *Buteo* hawks in north-central United States. Wilson Bull., **50**: 113–121, June 1938.

FRILEY, CHARLES E., JR., BENNETT, LOGAN J., AND HENDRICKSON, GEORGE. The American Coot in Iowa. Wilson Bull., **50**: 81–86, June 1938.

GABRIELSON, IRA N. Summer notes from Blue Sea Lake, Quebec. Canadian Field-Nat., **52**: 79–87, Sept. 1938.—List of birds seen.

GEYR VON SCHWEPPENBURG, H. Zur Systematik der *fuscus-argentatus*-Möwen. Journ. f. Ornith., **86**: 345–365, July 1938.—A reconsideration of the relationships of the Gray and the Herring Gulls and their subspecies with theories as to the origin of these forms. The problematical region of distribution is northwestern Russia and in Finland.

GODFREY, W. EARL. Yellow-crowned Night Herons in Nova Scotia. Canadian Field-Nat., **52**: 109, Oct. 1938.—Four records of single birds near Wolfville, September 13, 1932, July 28, 1937, August 12, 1937, September 14, 1925.

GRANIT, OLOF. Versuch zur quantitativen Untersuchung der Vogelfauna einer Fjeldgegend in Nordfinnland. Ornis Fennica, **15**: 53–65, Aug. 1938.—Census studies on open type of country in northern Finland.

GRANT, C. H. B., AND MACKWORTH-PRAED, C. W. [Seven notes on the status of certain African barbets, honey-guides, and other birds.] Bull. British Ornith. Club, **58**: 140–147, July 13, 1938.

GROTE, HERMANN. Der Terekwasserläufer (*Terekia cinerea* Gould) und sein Nest. Journ. f. Ornith., **86**: 457–465, July 1938.—Account of the nesting of this sandpiper near Orenburg, western Asia.

HAMPE, HELMUT. Bur Biologie des Singsittichs, *Psephotus haematonotus* (Gould). Journ. f. Ornith., **86**: 330–344, 7 text-figs., July 1938.—The habits, moult, breeding and nesting of this parrot in captivity.

HEINROTH, O. Das Baden der Vögel. Ornith. Monatsber., **46**: 97–100, July 27, 1938.—On bathing of birds. Dust baths only are taken by some open-country ground-living species as fowl, larks, bustards, but waterbirds and marshbirds never dust. Other species do both.

HINDWOOD, K. A. The occurrence of the White-tailed Tropic-bird in Australia. Emu, **38**: 12–14, pl. 6, July 1, 1938.—Account of a third specimen from the east coast of Australia. Characters given.

HOESCH, WALTER. Zur Balz von *Choriotis kori*. Ornith. Monatsber., **46**: 110–112, fig., July 27, 1938.—Display of this African bustard.

HOESCH, W. Vom Paradiesfliegenschnapper, *Terpsiphone viridis plumbeiceps*. Journ. f. Ornith., **86**: 328–329, pl. 14–15, July 1938.—Brief notes on the breeding of the Paradise Flycatcher in Southwest Africa, its most southern nesting area, where it is migratory, arriving about mid-November and raising two or three broods before leaving in mid-April, probably for the Congo region, where it occurs in the southern winter. Two photographs show the birds at the nest.

HOLLOM, P. A. D. Summaries on inland occurrences of some waterfowl and waders, 1924–1936. British Birds, **32**: 64–77, Aug. 1, 1938.—In England.

HOOPER, EMMET T. Another jay shoot in California. Condor, **40**: 162–164, July 15, 1938.

HUNTSMAN, A. G. North American Atlantic Salmon, [in] Comparative studies of the fluctuations in the stocks of fish in the seas of north and west Europe. Conseil Perm. Internat. Expl. Mer, Rapp. et Procès-verbaux des Réunions, **101**: (4, 1, B)

11–15, 3 figs., 1938.—In discussing fluctuations in the salmon population the author says, "An angler (Griswold, 1929) was the first to notice a scarcity occurring every nine years in the salmon of the Grand Cascapedia and Restigouche rivers, and as well in the commercial catches of Quebec and New Brunswick. Phelps and Belding (1931) confirmed this for the Restigouche angling catch in a very thorough analysis, finding the period to be nine or ten years. Independently Huntsman (1931) discovered it as occurring generally in the commercial catches and as far back as statistics have been collected. The average length of the period was determined as 9.6 years in close agreement with a periodicity in abundance of various fur-bearing animals (snowshoe rabbit, lynx, marten, etc.) of the interior of Canada. The ruffed grouse (*Bonasa*) of the interior shows a similar period."

As to the cause he states that "the unknown factor can best be considered as acting upon a particular smolt year-class, previous to its descent to the sea," and he continues, "Study of the river life has revealed the chief mortality of the larger parr as due to fish-eating birds (belted kingfisher and American merganser), which nest and rear their young along the salmon streams (White, 1936, 1937). These birds are largely unable to secure food when the streams are swollen and murky, as in rainy weather. I have accordingly explored the possibility of dry summers being responsible for increased mortality of the large parr (of the smolt year-classes related to the times of salmon scarcity) by restricting their habitat and exposing them to attack by birds. The last scarcity affected chiefly the 1926 and 1927 smolt year-classes and in correspondence with this the summers of 1923 to 1926 prove to have been dry, as shown by both rainfall and river discharge records. Pronounced scarcity of salmon is thus seen to follow with the proper interval, a succession of dry summers."

If this be correctly understood as placing the responsibility for depleted year-classes of salmon upon depredations by kingfishers and mergansers, the ornithologist can only say, "Try again." It is utterly incredible that birds existing in such small numbers could cause the fluctuations observed. It would seem that there might be numerous factors associated with dry years that could be inimical to the salmon population.—W. L. McAtee.

Illinois Audubon Society. The Audubon annual bulletin, no. 28, 44 pp., illus. Published by The Society, Chicago Acad. Sci., 1938.—With numerous brief articles by well-known contributors, on bird life of Ohio, Texas, the Chicago region, Michigan and Florida.

Ingram, G. C. S. The movements of the Dipper under water. British Birds, **32**: 58–63, Aug. 1, 1938.—Has never seen the Dipper use its wings under water, but it walks in and continues to walk on the bottom.

Iredale, Tom. William Anderson—ornithologist. Emu, **38**: 60–62, July 1, 1938.—Assistant surgeon on Cook's second voyage, Anderson was selected as naturalist on the third and fatal voyage. Two of his manuscript notebooks describing various animals, are preserved in the British Museum and stamp him as an able scientist. Otherwise, all that seems to be known of him is the date of his death, August 3, 1778.

Jourdain, F. C. R. On the occurrence of *Larus marinus* in Spitsbergen. Ibis, (14) **2**: 539–540, July 1938.—Correcting Marshall's recent statement as to a supposed 'first record' of the species from Spitsbergen, it is shown that the bird has been known from there since at least 1923, and that it has bred there for the last eight years. Colonization has taken place from Scandinavia via Bear Island, not from Greenland.

KALELA, OLAVI. Ueber die regionale Verteilung der Brutvogelfauna im Flussgebeit des Kokemäenjoki. Ann. Zool. Soc. Zool.-Bot. Fennicae, Helsingfors, **5**: no. 9, xv plus 291 pp., 81 text-figs., 1938.—A detailed analysis of the geographical distribution of the breeding birds of this part of Finland, and the causes influencing it.

KELLOGG, P. Hunting the songs of vanishing birds with a microphone. Journ. Soc. Motion Picture Engineers, **30**: 201–207, 5 figs., Feb. 1938.

KINNEAR, N. B. [A new *Sheppardia* from Nyasaland.] Bull. British Ornith. Club, **58**: 138–139, July 13, 1938.—*Sheppardia bensoni*.

KÖNIG, D. Zum Balzflug des Habichts. Beitr. z. Fortpflanzungsbiol. d. Vögel, **14**: 129–130, fig., July 1938.—Aërial courtship actions.

KUERZI, RICHARD G. Some notes on the birds of St. Lucie County, Florida. Florida Naturalist, new ser., **12**: 11–15, Oct. 1938.

LASHMAR, ALLEN F. C. Notes on birds found in the eastern portion of Kangaroo Island. South Australian Ornithologist, **14**: 183–185, July 1, 1938.

LAY, DANIEL W. Some relations of Bobwhite Quail to second-growth pine woodland in Walker County, Texas. Trans. 2d No. Amer. Wildlife Conference, Mar. 1–4, 1937, St. Louis, Missouri, pp. 575–578, 1938.—Proper control of vegetation so as to extend the early sapling growth of pine would favor a concentration of the birds in such areas.

LAY, DANIEL W., AND SIEGLER, HILBERT R. The Blue Jay as link between acorn and Quail. Trans. 2d No. Amer. Wildlife Conference, Mar. 1–4, 1937, St. Louis, Missouri, pp. 579–581, 1938.—The number of acorns made available to Quail by Blue Jays "is so great, that the jay is very likely the most important link between the acorn and the quail" in woodlands of Walker County, Texas.

LEACH, E. P. Recovery of marked birds. British Birds, **32**: 78–82, 107–112, Aug.–Sept. 1938.—Summary of recoveries of birds recently banded in British Isles.

LEDLIE, REGINALD C. B., AND PEDLER, EDWARD G. Nesting of the Little Ringed Plover in Hertfordshire. British Birds, **32**: 90–102, pls. 3–4, Sept. 1, 1938.—A detailed account of the nesting of this species which has only recently become a breeding bird in the British Isles.

LEGENDRE, MARCEL. Ornithologie Parisienne. L'Oiseau et Rev. Française d' Ornith., new ser., **8**: 267–283, 1938.—A briefly annotated list of the birds found in the immediate region of Paris, with bibliography.

LEWIS, HARRISON F. Occurrence of the Lapland Longspur in the Ottawa district. Canadian Field-Nat., **52**: 93, Sept. 1938.—Three seen near Ottawa, December 26, 1937, are the first to be noted there since 1890.

LEWIS, HARRISON F. Musical warble of the Savannah Sparrow. Canadian Field-Nat., **52**: 93–94, Sept. 1938.

LEWIS, HARRISON F. Greater Yellow-legs and Pigeon Hawk. Canadian Field-Nat., **52**: 94, Sept. 1938.—The former sought refuge in a pool of water when a Pigeon Hawk stooped at them.

LIBBERT, WALTER. Der Zug des Kranichs. Journ. f. Ornith., **86**: 374–378, July 1938.—Migration of the European Crane.

LINSDALE, JEAN M. Bird life in Nevada with reference to modifications in structure and behavior. Condor, **40**: 173–180, July 15, 1938.—An account of adaptive behavior and structure shown by Nevada birds in response to local conditions.

LOCKLEY, R. M. We live alone, and like it—on an island. Nat. Geogr. Mag., **74**: 253–278, illustr., Aug. 1938.—An illustrated account of life and particularly the bird life of Skokholm, bird sanctuary off the coast of Wales.

LOWE, PERCY R. Some anatomical notes on the genus *Pseudochelidon* Hartlaub with reference to its taxonomic position. Ibis, (14) **2**: 429–437, pl. 7, July 1938.—Concludes that it is a true swallow, not requiring a separate family for its reception.

LUTTRINGER, LEO A., JR. Pymatuning, a paradise for sportsmen. American Forests, **44**: 447, 466, illustr., Oct. 1938.—Illustrations of birds.

LUTTRINGER, LEO A., JR. Pennsylvania bird-life. A booklet designed to further the study and appreciation of our feathered friends. Bull. Pennsylvania Game Comm., Harrisburg, no. 17, 66 pp., col. pl., illustr., 1938.—An attractive popular account of some familiar birds and methods for attracting and observing them.

MACLULICH, D. A. Birds of Algonquin Provincial Park. Contrib. Roy. Ontario Mus. Zool., no. 13, 47 pp., 1938.—A list of 169 species, of which 32 occur as residents or winter visitors.

MACKWORTH-PRAED, C. W., AND GRANT, C. H. B. Systematic notes on East African birds. Ibis, (14) **2**: 525–533, July 1938.—On the races of the Redshank occurring in East Africa and a brief review of the *Apalis* group in this region and South Africa.

MADON, PAUL. Notes sur quelques espèces. Alauda, (3) **10**: 62–75, 1938.—Miscellaneous notes on habits of various European birds.

MARIETTI, GIUSEPPE. Di una serie di "ovum in ovo" di gallina ibrida da Libornese e Orpington. Rivista Ital. di Ornitologia, **8**: 17–22, Jan. 1938.—A fowl hybrid of Livornese by Orpington breeds, produced several enormous eggs, which with other abnormal eggs are here described.

MATHEWS, GREGORY M. Overlooked names of European and other birds from the 'Analyst' and other sources. Ibis, (14) **2**: 521–524, July 1938.—Three overlooked names for American birds are: *Philomeloides*, type *Turdus mustelinus* Gmelin; *Bombicilla cedrus* C. T. Wood, for the Cedar Waxwing; *Hirundo garrula* C. T. Wood, for the Chimney Swift.

MATTINGLEY, A. H. E. Birds of the Hogans and other islands of Bass Straits. Emu, **38**: 7–11, pl. 5, July 1, 1938.—A breeding place of "millions" of seabirds.

MAYAUD, NOËL. La Gorge-bleue à miroir en France. Alauda, (3) **10**: 116–136, 1938.—Three races of the Blue-throat occur in France, of which two breed. The plumages, distribution and general biology are described.

MAYAUD, NOËL. Commentaires sur l'ornithologie française. Alauda, (3) **10**: 188–198, 1938.—Additional notes on waterbirds since the publication of his list of the birds of France.

MAYAUD, NOËL. L'avifaune de la Camargue et des grands étangs voisins de Berre et de Thau. L'Oiseau et Rev. Française d'Ornith., new ser., **8**: 284–349, 3 pls., 1938.—A list of birds of the famous Camargue region of France, with an extensive bibliography. One of the plates shows a flock of Flamingos in flight, a species which still nests in the marshes of the Camargue, though probably not in every year. One or two hundred birds may winter, but the summer population may reach ten thousand.

MEINERTZHAGEN, R. On the birds of northern Afghanistan. Ibis, (14) **2**: 480–520, pls. 10, 11, July 1938.—Account of a collection made, and with remarks on the fauna and country.

MENGEL, ROBERT M. The waterfowl of Kentucky. Kentucky Warbler, **14**: 25–28, 1938.—A briefly annotated list.

MEYLAN, OLIVIER. Premiers résultats de l'exploration ornithologique de la Dombes. Alauda, (3) **10**: 3–61, 1938.—An account of this well-situated ornithological station in the interior of France, with an annotated list of its birds. Where the three

species nest in close proximity, eggs of both Black-headed Gull and Black Tern were occasionally found in nests of the Black-necked Grebe.

MICHAEL, CHARLES W. Does the Ouzel use its wings in swimming? Condor, **40:** 185–186, July 15, 1938.—Pertinent to recent discussion in British journals, are the observations of this author that the Ouzel does not use its wings under water but usually feeds on the bottom, heading upstream, and that the force of the current holds it down. In one instance a bird was frequently seen swimming on the surface near its nest.

MICHENER, HAROLD, AND JOSEPHINE R. Bars in flight feathers. Condor, **40:** 149–160, 5 sets of figs., July 15, 1938.—Each of the bars in a flight feather similar in appearance to a watermark in paper, represents a day's growth. These bars are not usually shown by juvenal feathers.

MILLER, LOYE. The singing of the Mockingbird. Condor, **40:** 216–219, text-fig. 59, Sept. 15, 1938.—Analysis of the character of the song at different seasons.

MOLTONI, EDGARDO. Escursione ornitologica all'Isola degli Uccelli (Golfo della Gran Sirte, Cirenaica). Rivista Ital. di Ornitologia, **8:** 1–16, Jan. 1938.—An account of the colony of Caspian and Rüppell's Terns on this small island off the north coast of Africa.

MOREAU, R. E. [A new *Artisornis*, from Morogoro district, Tanganyika Territory.] Bull. British Ornith. Club, **58:** 139, July 13, 1938.

MURIE, OLAUS J. Four birds new to St. Lawrence Island, Alaska. Condor, **40:** 227, Sept. 15, 1938.—These are: Rusty Blackbird, Gray-cheeked Thrush, Slate-colored Junco, and Mountain Accentor (*Prunella montanella*), of the last of which this is the second record for the North American area.

MURPHY, ROBERT CUSHMAN. Birds of the high seas. Nat. Geogr. Mag., **74:** 226–235, continued as Wings over the bounding Main, 227–231, 7 photographic illustrations and 8 colored plates by Allan Brooks, Aug. 1938.—An interesting and well-illustrated account of albatrosses, petrels, gannets, tropic-birds and man-o'-war birds.

NATORP, O. Zur Brutbiologie des Pirols (*Oriolus oriolus* L.). Beiträge z. Fortpflanzungsbiol. d. Vögel, **14:** 121–123, July 1938.—Plumage changes. The adult male Golden Oriole does not acquire full plumage until its third year.

NICHOLSON, E. M. The index of heron population, 1938. British Birds, **32:** 138–144, Oct. 1, 1938.—British figures indicate an increase in the population of *Ardea cinerea* of about eight per cent in the last two years.

NICKELL, WALTER P. Bird sounds as an aid to identification. Jack-pine Warbler, **8:** 11–12, July 1938.

NIETHAMMER, G. Welche Brutvogel Oesterreichs sind neu fur Deutschland? Ornith. Monatsber., **46:** 101–107, July 27, 1938.—The annexation of Austria by Germany has added at least nine breeding species to the German list!

OLIVIER, GEORGES. Les oiseaux de la Haute-Normandie. L'Oiseau et Rev. Française d'Ornith., new ser., **8:** 99–218, 4 pls., 1938.—An annotated list of the birds of this region of France.

ORFILA, RICARDO N. Los psittaciformes argentinos. El Hornero, **7:** 1–21, pl. 1, text-fig. 20–30, Aug. 1938.—The concluding part of a review of the characters of Argentine parrots.

PAATELA, J. E. Beobachtungen über das Verhalten der Vögel in der Sommernacht. Ornis Fennica, **15:** 65–69, Aug. 1938.—With an interesting table of length of sleeping period of certain day-living birds in southern Finland in summer, ranging from less than an hour in the twenty-four in the case of the Redshank, to nearly six hours in the case of a siskin.

PALAS, ARTHUR J. Extreme northeastern Iowa for bird observation. **Iowa Bird Life, 8:** 34–36, Sept. 1938.

PALMGREN, P., AHLQVIST, H., AND SYLVIN, E. Einige Labyrinthversuche mit Kleinvögeln und Mäuse. Ornis Fennica, **15:** 74–77, Aug. 1938.—Comparison of the action of four small birds in a labyrinth, with the behavior of a white mouse. The birds quickly learned the labyrinth, but the mouse seemed slower on account of its more thorough exploratory movements.

PEREYRA, José A. Algunos nidos poco conocidos de nuestra avifauna. **El Hornero, 7:** 24–30, 5 figs., Aug. 1938.—Nests of some rarer Argentine birds.

PICKWELL, GAYLE, AND SMITH, EMILY. The Texas Nighthawk in its summer home. Condor, **40:** 193–215, text-fig. 45–58, Sept. 15, 1938.—A well-illustrated account of the courtship and nesting of this species. The nesting female was observed to go though its 'intimidation display' at the approach of a quadrupedal enemy but on the approach of a human the distress simulation was given. In the case of the European Nightjar, it has been shown that the reaction to a biped at night is intimidation, but this apparently was not tried.

PUTZIG, P. Ueber das Zugverhalten umgesiedelter englischer Stockenten (*Anas p. platyrhyncha*). Der Vogelzug, **9:** 139–145, text-fig., July 1938.—Eggs of the sedentary Mallards of the British Isles were hatched in Prussia and the young grew up and failed to migrate. The next year, however, their progeny did migrate to some extent.

REGNIER, ROBERT. Les collections ornithologiques du Muséum de Rouen. **L'Oiseau et Rev. Française d'Ornith., new ser., 8:** 228–236, 1938.—A brief account of the bird collection, principally the exhibitions, in the museum at Rouen, with mention of a few of its rarities. The local collection is exceptionally good.

RETT, EGMONT Z. Hailstorm fatal to California Condors. Condor, **40:** 225, Sept. 15, 1938.—Two found freshly killed from the effect of a storm of hailstones as 'large as walnuts'.

RICHTER, ROLAND. Beobachtungen an einer gemischten Kolonie von Silbermöwe (*Larus argentatus* Pont.) und Heringsmöwe (*Larus fuscus graellsi* Brehm). Journ. f. Ornith., **86:** 366–373, July 1938.—In a mixed colony of Herring and Gray Gulls, the distribution is believed to be determined by the number of available standing places for the adults.

RILEY, J. H. Three new birds from Banka and Borneo. Proc. Biol. Soc. Washington, **51:** 95–96, May 19, 1938.—*Porzana pusilla mira* from East Borneo, *Rhopodytes sumatranus minor* from Dutch East Borneo, and *Erythrocichla bicolor bankana* from Banka.

RUTHKE, PAUL. Am Brutplatz des Nord-Seetauchers. Beitr. z. Fortpflanzungsbiol. d. Vögel, **14:** 131–136, July 1938.—Nesting habits of Red-throated Loon on the arctic coast of Finland.

RUTTLEDGE, ROBERT F. Bird-migration by the overland route between Killala Bay and Galway Bay [Ireland]. British Birds, **32:** 130–135, Oct. 1, 1938.

SCHARNKE, HANS, AND WOLF, ANTON. Beiträge zur Kenntnis der Vogelwelt Bulgarisch-Mazedoniens. Journ. f. Ornith., **86:** 309–327, July 1938.

SCHILDMACHER, H. Zur Physiologie des Zugtriebes. IV. Weitere Versuche mit künstlich veränderter Belichtungszeit. Der Vogelzug, **9:** 146–152, July 1938.—Redbreasts subjected to increased artificial lighting showed nightly activity (the 'migratory urge') in the first half of February while in control birds without such lighting these reactions did not set in for a week to three weeks later.

SERVENTY, D. L. Waders and other aquatic birds on the Swan River estuary, Western Australia. Emu, **38:** 18–29, July 1, 1938.

SERVENTY, D. L. A guide to the field identification of the waders. Emu, **38**: 65–76, pl. 26, July 1, 1938.—With a field key to the various Australian shorebirds.

SHARLAND, M. S. R. Two small terns (*Sterna albifrons* and *Sterna nereis*). Emu, **38**: 1–7, pls. 1–4, July 1, 1938.—Nesting habits in southern Australia.

SHARLAND, M. S. R. Mimicry in wild cockatoos. Emu, **38**: 17, July 1, 1938.—Reports a case of a wild Yellow-tailed Black Cockatoo imitating some of the utterances of the Kookaburra.

SHAW, TSEN-HWANG. The avifauna of Tsingtao and neighbouring districts. Bull. Fan Mem. Inst. Biol., zool. ser., **8**: 134–222, map, June 25, 1938.—An annotated list of the 253 species ascertained to occur in this district of China.

SHUEL, RONALD. Further notes on the eggs and nesting habits of birds in northern Nigeria (Kano Province). Ibis, (14) **2**: 463–480, pl. 9, July 1938.

SNYDER, L. L. The northwest coast Sharp-shinned Hawk. Occas. Papers Roy. Ontario Mus. Zool., no. 4, 6 pp., July 14, 1938.—Describes as a new race *Accipiter striatus perobscurus* from Queen Charlotte Islands, British Columbia.

SNYDER, L. L. A faunal investigation of western Rainy River district, Ontario. Trans. Roy. Canadian Inst., **22**: pt. 1, 157–213, 1938.—Lists the mammals and birds with notes. The Starling has lately reached this region.

SNYDER, L. L., AND HOPE, C. E. A predator-prey relationship between the Short-eared Owl and the meadow mouse. Wilson Bull., **50**: 110–112, June 1938.—Convergence of owls to feed on the meadow mouse when the population of the latter had reached plague proportions.

STANFORD, J. K., AND TICEHURST, CLAUD B. On the birds of northern Burma.—Part III. Ibis, (14) **2**: 391–428, July 1938.

STECHOW, JAN. Ueber die jahreszeitliche Verbreitung der europäischen Lummen (*Uria aalge* (Pont.)). Der Vogelzug, **9**: 125–138, 3 maps, July 1938.—Results of banding European Guillemots at Helgoland.

STEINFATT, OTTO. Das Brutleben der Waldschnepfe. Journ. f. Ornith., **86**: 379–424, July 1938.—An extensive account of the migration, courtship, breeding and nest life of the European Woodcock.

STEINFATT, OTTO. Das Brutleben der Sumpfmeise und einige Vergleiche mit dem Brutleben der anderen einheimischen Meisen. Beitr. z. Fortpflanzungsbiol. d. Vögel, **14**: 137–144, July 1938.—Breeding habits of the Marsh Tit.

STRESEMANN, ERWIN. Ueber einige seltene Vögel aus Ecuador II. Ornith. Monatsber., **46**: 115–118, July 12, 1938.—Concludes brief notes on certain rarer birds from Ecuador, including a new race of parrot, *Touit emmae papilio*, from Oriente province.

STRESEMANN, ERWIN. *Spizaëtus alboniger* (Blyth) and *Spizaëtus nanus* Wallace zwei falschlich vereinigte Arten. Journ. f. Ornith., **86**: 425–431, July 1938.—These two raptorial species of the Malay region are distinct and the characters of each are pointed out.

SUTTON, GEORGE MIKSCH. The breeding birds of Tarrant County, Texas. Annals Carnegie Mus., **27**: 171–206, Sept. 24, 1938.—This list, based mainly on earlier observations of the author from 1911–1914 in the vicinity of Fort Worth, Texas, is valuable as a record of the many changes that have taken place locally through settlement and the formation of an artificial lake.

TICEHURST, N. F. Incubation-period of Common Gull. British Birds, **32**: 87, Aug. 1, 1938.—A summary of four instances makes the period twenty-two to twenty-three days for *Larus canus* in Kent, England.

TREUENFELS, H. VON. Beobachtungen an Weidenlaubvogel (*Phylloscopus c. col-*

lybita). Beiträge z. Fortpflanzungsbiol. d. Vögel, **14**: 124–129, July 1938.—Nesting habits; weather has much influence on the time required in nest building.

TROUCHE, LUCIUS. Le Flamant Rose de Camargue erratique? sédentaire? nicheur?. Alauda, (3) **10**: 159–187, 1938.—Status of the Flamingo in the Camargue: not a true resident in 1931–34, not breeding but appearing as a straggler in the first half of the year, but in numbers from July to December, when two groups arrive, one in July, the main body in August.

TROUT, ALLAN M. A castle has been built. Kentucky Warbler, **14**: 28–31, 1938.—An account of the Audubon Museum at Henderson, Kentucky.

TUFTS, R. W. First recorded nest of Baltimore Oriole for Nova Scotia. Canadian Field-Nat., **52**: 109, Oct. 1938.—At Berwick, 1938.

VAN ROSSEM, A. J. [Descriptions of twenty-one new races of Fringillidae and Icteridae from Mexico and Guatemala.] Bull. British Ornith. Club, **58**: 124–138, July 13, 1938.

VAN ROSSEM, A. J. A northwest race of the Cinnamon Hummingbird. Condor, **40**: 226–227, Sept. 15, 1938.—The pale bird of northwestern Mexico is described as *Amazilia rutila diluta*.

VAN ROSSEM, A. J. A race of the Green Kingfisher from northwestern Mexico. Condor, **40**: 227–228, Sept. 15, 1938.—The new race is named *Chloroceryle americana leucosticta*, type from Saric, extreme northern Sonora.

VIEHMEYER, GLENN. Is the Prairie Chicken passing? Nebraska Bird Review, **6**: 25–28, Sept. 20, 1938.—"Today Prairie Chickens have disappeared over the greater part of their former range" and in Nebraska are now confined mostly to the sandhill region where they can be numbered by dozens in places that only a few years ago supported thousands. Refuges are recommended.

VÖLKER, OTTO. Porphyrin in Vogelfedern. Journ. f. Ornith., **86**: 436–456, 3 textfigs., July 1938.—An important paper on the occurrence of porphyrin as a coloring matter in feathers, and especially on its presence in the bustard, *Lophotis ruficrista*. This pigment is of the same group as turacin which produces the red coloring of the Turaco. It has been isolated from the bustard's feathers in the form of coproporphyrin III and its chemical and physical properties have been studied. It is found also in the eggshell and dung, and its formation may be regarded as an excretory process.

VÖLKER, OTTO. Ein eigenartiges Prinzip der Federpigmentierung. Ornith. Monatsber., **46**: 107–110, July 27, 1938.—The dull red ornamental feathers of the African bustard, *Lophotis*, owe their color to a powder which can be rubbed off and belongs to the porphyrin group, though lacking red fluorescence after exposure to ultra-violet light. The first to report this colored powder was H. Lynes.

VOGT, WILLIAM. Preliminary notes on the behavior and ecology of the Eastern Willet. Proc. Linn. Soc. New York, no. 49, 42 pp., 2 pls., Oct. 1938.—Results of a study of breeding birds carried on in the salt marshes near Fortescue, New Jersey. The birds are apparently monogamous and are usually paired before claiming territory. The male defends the female before territory. The birds are able to recognize the sex of other individuals by other means than trial and error.

VOGÜÉ, GEORGES DE, AND JOUARD, HENRI. Premiers résultats de l'enquête sur les Anatides. Alauda, (3) **10**: 137–158, 1938.—Summary of notes contributed by various observers relative to the ducks of France.

WALTERS, DON L. Destruction of nesting areas in Missouri river bottoms. Oologist, **55**: 78–79, July 1938.—Nesting areas destroyed by clearing in 1934 were flooded in 1935, with great destruction of nests and subsequent reduction of the bird population.

WETMORE, ALEXANDER. A fossil duck from the Eocene of Utah. Journ. Palaeontol., **12**: 280–283, 5 text-figs., May 1938.—*Eonessa anaticula* new genus and species, based on wing bones about the size of a Lesser Scaup.

WHITLEY, GILBERT P. New species in newspapers. Emu, **38**: 63–64, July 1, 1938.—A list of new species of birds and fishes described by Ramsay in early newspapers of New South Wales are here brought to light.

WHITTELL, MAJOR H. M. The birds of the Bridgetown district, South-western Australia. Part II. Emu, **38**: 54–59, pl. 24, July 1, 1938.

WOODBURY, A. M., AND SUGDEN, JOHN W. An hour in the life of a Broad-tailed Hummingbird. Condor, **40**: 160–162, fig., July 15, 1938.

ZANGHERI, PIETRO. Fauna di Romana, uccelli. Elenco ragionato di tutte le specie fino ad oggi osservate in Romagna e notizie di indole generale. Rivista Ital. di Ornitologia, **8**: 23–36, Jan. 1938.—Concluding part of this list of birds of Rome.

ZIMMER, JOHN T. A new form of *Crypturellus noctivagus*. Proc. Biol. Soc. Washington, **51**: 47–52, Mar. 18, 1938.—Describes as new *C. n. duidae* from Mt. Duida, Venezuela.

ZIMMER, JOHN T. Studies of Peruvian birds. No. XXIX. The genera *Myiarchus*, *Mitrephanes*, and *Cnemotriccus*. Amer. Mus. Novitates, no. 994, 32 pp., June 2, 1938.—Critical and distributional notes, including the description of five new races of *Myiarchus* and one of *Cnemotriccus*.

ZOTTA, ANGEL R. Nuevas adiciones à la avifauna argentina. El Hornero, **7**: 46–64, Aug. 1938.—Adds twenty species to the known avifauna of Argentina.

OBITUARIES

NATHANIEL GIST GEE, Corresponding Fellow of the American Ornithologists' Union, died suddenly, December 18, 1937, following an attack of influenza that weakened the heart. Born in Union, South Carolina, April 20, 1876, and receiving his M.A. degree from Wofford, 1898, in 1901, following educational work in the United States, he began an epochal career in Soochow University, China. His was the first Department of Biology in the colleges of China, so furnishing leaders for what was destined to be a popular subject, and Soochow men went forth to head Biological Departments in the Universities of Yenching, Nanking, Amoy, Nankai, and elsewhere. In 1921–22, Dr. Gee toured a number of Asiatic and Australasian countries, and then joined with the Rockefeller Foundation, serving in several important positions in premedical and medical education, and as adviser for China in Natural Sciences. When this work was completed, in 1932, he was selected as Vice-president of Yenching University, serving thus until 1935. Returning to his native State he became head of the Biology Department of Lander College, Greenwood, South Carolina, a position which he held at the time of his death.

He was connected with a number of Chinese and American scientific societies, was the author of several text-books for use in the schools of China, of numerous articles on freshwater sponges, and co-author of Gee, Moffett and Wilder's 'Chinese Birds.' Back in America, he began and edited 'South Carolina Natural History,' publishing an interesting variety of subjects. One of his last works was overseeing the gathering into one of several such serial articles on Indian place-names in upper South Carolina. Thus while ancestrally English, and having devoted his life mostly to China, his concluding work had to do with saving lore of the aborigines in his native State. It is not inappropriate that a supplementary list of names published since Dr. Gee's death has been bound in with the material he had reprinted from his publication, and instead of the usual "Finis" there is a memorial legend to him with a farewell inscription in the musical open syllables of the Cherokee aborigines of Carolina. His was a distinct contribution to the neighborhood research movement. Technically expert, biology was with him 'the science of life' and not a mere thanatology of preserved and functionless laboratory specimens. An educational pioneer in China, he returned to his native State to pioneer in a new way. His loss is a distinct one, not merely to his Carolina, but to the educational forces of the South.—A. L. PICKENS.

We regret to record the death, on November 14, 1938, of Dr. JOHN C. PHILLIPS a Fellow of the A. O. U. since 1925, well known for his many contributions to ornithology, culminating in the four-volume, quarto work on the 'Natural History of the Ducks.' He was born at Boston, November 5, 1876, and graduated from Harvard in 1895, later from the Harvard Medical School in 1904. His loss will be keenly felt by the many organizations and institutions of which he was an integral part. In his later years he devoted much energy to conservation of wildlife. It is hoped that a more extended notice of his ornithological work will appear later in 'The Auk.'—G. M. ALLEN.

THE FIFTY-SIXTH STATED MEETING OF THE AMERICAN ORNITHOLOGISTS' UNION

BY LAWRENCE E. HICKS

THE thirteenth Washington meeting, held October 17–22, 1938, was the second largest in attendance in the history of the Union. Headquarters were at the Raleigh Hotel and most of the business sessions were held there. The public sessions were held at the U. S. National Museum.

Business Sessions.—The meetings on Monday, October 17, included two sessions of the Council, a meeting of the Fellows at 4 p. m. and a meeting of the Fellows and Members at 8 p. m. The evening business meeting established an attendance record, with 73 present—31 Fellows and 42 Members.

The elections resulted in the addition of one Fellow, two Honorary Fellows, six Corresponding Fellows, eight Members and 338 Associates. On November 1, 1938, there were no vacancies remaining in the classes of Fellows or Members, but there were two vacancies in the list of Honorary Fellows, and thirteen places to be filled in the list of Corresponding Fellows. Additional vacancies in the other classes are certain to be created before the date of the 1939 meeting. Members are urged to keep in mind that the latest date for filing nominations for the elections at the 1939 California meeting, is March 19, 1939. Nomination blanks may be obtained from the Secretary.

The Treasurer's report was accepted upon recommendation of the Auditing Committee (Hoyes Lloyd and Ernest G. Holt). It showed total receipts for the fiscal year of $7,519.10, total disbursements of $8,329.84, and a cash balance of $416.80. The Trustees' Report showed that the Endowment Fund was in good condition. The Secretary, in his report, asked for suggestions from the members as to how the duties of the Secretary, as outlined in the constitution and by-laws, could be made more effective and beneficial to the Union. His report showed that 338 Associates had been nominated during the past year, and that seven members had been lost by resignation and twenty-four by death.

Dr. W. L. McAtee retired as Treasurer after a long and distinguished service of eighteen years in that office. He accompanied his resignation with a message to the Union which emphasized the following points: (1) that the Union is now in a critical transition stage of development which requires a new dedication of service on a generous scale; (2) that the Union's progress in the past was not automatic, but made possible by the vigorous efforts of zealous leaders with definite objectives, and that similar new leaders must be developed to take up the work; (3) that some way must be found to better finance the work of the Union and relieve the 'publication pressure'

for space in 'The Auk', and that experience has shown that this cannot be done by increasing the number of members, as all the Union's publications are now sold at less than cost; (4) that the Union should re-define its objectives and decide whether it is to be a strictly scientific, a conservation, or a general-purpose ornithological society; and (5) that the Union should qualify itself to rank as a truly national organization, giving representation to affiliated regional societies, and become more responsive to criticisms which might point the way to real progress.

The vacancy created in the Treasurer's office was filled by the election of W. Rudyerd Boulton of Chicago. Three members of the Council retired after long and valuable service: Dr. H. C. Oberholser, Dr. T. S. Roberts and Mr. P. A. Taverner, and were replaced by W. L. McAtee, John T. Zimmer and Robert T. Moore.

Two amendments to the by-laws were presented and placed on the table for consideration at the 1939 meeting. The first raises the maximum limit for the number of Members from 125 to 150. The second would make the Editor a member of the Council. A third amendment was referred for study to a committee to be appointed by the President, to be reported upon at a subsequent meeting. This amendment provides that regional ornithological societies may qualify for affiliation with the Union and be granted a voting representative in the Council.

The award of the Brewster Medal was made to Dr. Thomas S. Roberts in recognition of his work, 'The Birds of Minnesota.' Dr. T. S. Palmer reported for the Committee on Biography and Bibliography. Dr. Friedmann, Dr. L. J. Cole, Dr. Ernst Mayr and P. A. Taverner reported for the various divisions of the Research Committee. The Council voted to approve in principle the appointment and functioning of the A. O. U. Research Committee. Dr. Alexander Wetmore reported for the Committee on Classification and Nomenclature of North American Birds. Communications were read from A. F. Ganier, A. C. Bent, A. F. Harris, Henry Mouseley, B. P. Tyler and M. A. Carriker.

Dr. Alexander Wetmore, President of the Tenth International Ornithological Congress, which will meet in the United States in 1942, announced the tentative arrangements. The Union voted to hold a joint meeting with the 1942 Congress in early May, with headquarters at the Philadelphia Academy of Sciences. Later, trips are to be arranged for visitors to Cape May and Washington, D. C. Everything indicates that a large number of European delegates will be in attendance.

The Ninth International Congress held at Rouen, France, in May 1938, had 23 in attendance from North America. The following were official A. O. U. delegates: Alexander Wetmore, J. C. Greenway, J. P. Chapin, T. G. Pearson, Lawrence E. Hicks, J. H. Fleming and Mrs. M. M. Nice.

The first five named were also representatives of the U. S. Government. Other A. O. U. members attending included A. A. Allen, A. R. Brand, George M. Sutton, W. E. C. Todd, A. J. van Rossem, Hugh Birckhead, Ernst Mayr, L. S. Crandall and J. Southgate Hoyt.

The President reported that the appointment of an Endowment Committee had been deferred until members interested in serving could be found. The Council voted to have printed in 'The Auk' and mailed in the next annual letters, a suitable form of bequest to bring to the attention of the members the great need of the Union for an increased endowment fund.

W. Rudyerd Boulton reported on the Ridgway Memorial Fund Sanctuary in Illinois. The Council passed a resolution commending the activities of the Ridgway Memorial Association and the University of Chicago in preserving the sanctuary and safeguarding its interests, and expressing the hope that the study of ornithology would be encouraged as much as possible by the granting of fellowships from the Ridgway Fund.

Dr. Alden H. Miller, Chairman of the Local Committee for the 1939 meeting which is to be held in the San Francisco Bay region June 19–23, 1939, reported on the arrangements in progress. A large representation of eastern ornithologists at the 1939 meeting is assured. Three invitations were received for the 1940 meeting: Cleveland, New York City and Milwaukee. A decision on the time and place of the 1940 meeting was postponed until the next meeting of the Union in California.

The Union voted to accept the report of the Committee on Bird Protection (William Vogt, Victor Cahalane, Clarence Cottam and Aldo Leopold). The full report will appear in a later issue of 'The Auk'.

The Union adopted the report of the Resolutions Committee (Alexander Sprunt, Jr., Herbert L. Stoddard, J. J. Murray and Roger T. Peterson). This expressed appreciation to the following for their contributions to the 1938 meeting: the Local Committee (Herbert Friedmann, H. G. Deignan, W. C. Henderson, Frederick C. Lincoln and W. L. McAtee), the authorities of the Smithsonian Institution and the National Museum, the personnel of the Biological Survey, the Ladies' Committee for their entertainment of the wives of visiting members, and the officials of the National Agricultural Research Center and of the Patuxent Refuge.

Public Meetings.—The public meetings opened on Tuesday morning with an address of welcome by Dr. Alexander Wetmore of the U. S. National Museum, and a response by Vice-President James P. Chapin. The program included fifty-nine papers, of which nine were read by title, and as usual covered a wide range of subjects, both popular and technical. Thursday morning there was a joint session with the Inland, Eastern and Northeastern Bird-banding Associations. The Tuesday afternoon session was a symposium on the subject, 'The Problem of the Individual vs. the Species in Bird

Studies.' Dr. Herbert Friedmann introduced papers on various phases of this subject which were presented by Dr. Francis H. Herrick, Dr. G. K. Noble, Mrs. Margaret M. Nice, Frederick C. Lincoln and N. Tinbergen. On Wednesday and Thursday afternoons motion pictures were in order, with probably as fine a collection of colored bird-films as has ever appeared on one program. Classified as to content, the papers covered the following subjects: life history and food habits, 13; faunal, 12; behavior, 9; exploration, 8; general or miscellaneous, 6; conservation or education, 8; waterfowl, 5; distribution and migration, 5; anatomy and physiology, 5; bird-banding, 4; biography, 2; and taxonomy, 2.

Social Events.—On Tuesday evening open house was held in the Division of Birds of the National Museum. Wednesday evening was occupied by the annual dinner at the Raleigh Hotel, with 304 present. The chief entertainment was provided by the Allen-Brand-Kellogg trio from Cornell, with a travelogue in color and some remarkable sound effects without. 'The Auklet' exhibited a three-dimensional growth as compared with previous years, but retained its usual meaty nature. Throughout the week the Ladies' Committee arranged many social and sight-seeing events for the wives of visiting members. Wednesday noon a group photograph was taken of 217 members and visitors present at that time. Prints of the photo can be obtained at $1.50 from the Tenschert Photo Co., 1203 F and 608–12th Streets, N. W., Washington, D. C. An identification key has been prepared and may be obtained without cost from the Secretary.

Excursions.—Friday, October 21, was occupied by an all-day field trip to the Patuxent Wildlife Research Refuge near Beltsville, Maryland. About 310 tickets were sold for the trip. The group spent a most enjoyable day covering the 17,000 acres of the Agricultural Center and the 3,000 acres of the Biological Survey experimental tracts, either on foot or by auto. Many parties reported large flocks of migrating birds. After the exercise everyone appreciated the splendid chicken dinner prepared in outdoor ovens by enrollees of the C. C. C. Camp. Many of those remaining in Washington met at the National Zoological Park at 10 a. m. Saturday for conducted tours of the large collections of living birds and mammals.

THE PROGRAM

Papers are arranged in the order in which they were presented at the meeting. Starred papers were illustrated by lantern slides; those with a double star were illustrated by motion pictures.

TUESDAY MORNING

Welcome by ALEXANDER WETMORE, Assistant Secretary, Smithsonian Institution.

Roll Call of Fellows and Members, Report of the Business Meeting, announcement of the result of elections.

Report of the Local Committee on Arrangements, HERBERT FRIEDMANN, U. S. National Museum, *Chairman*.

1. Fall singing of birds. ARETAS A. SAUNDERS, Fairfield, Connecticut.
2. What constitutes an ornithological education? PAUL KELLOGG, Cornell University, Ithaca, New York.
3. A plea for a critical attitude. WILLIAM VOGT, National Association of Audubon Societies, New York City. (Read by title.)
4. *The distribution of Kirtland's Warbler. J. VAN TYNE, Museum of Zoology, Ann Arbor, Mich.
5. Waterfowl at James Bay, Canada. HARRISON F. LEWIS, National Parks Bureau, Ottawa, Canada.
6. Ducks at Delta, Manitoba. MILES D. PIRNIE, Kellogg Sanctuary, Augusta, Mich.
7. *The Phelps Expedition to Mt. Auyan-tepui, Venezuela. E. THOMAS GILLIARD, American Museum of Natural History, New York City.
8. *The Canadian Zone in the Southern Mountains. J. J. MURRAY, Lexington, Virginia.
9. *Notes on the summer birds of the Great Smoky Mountains. ALBERT F. GANIER, Nashville, Tennessee. (Read by title.)
10. *The breeding birds of the eastern Kentucky Mountains. LAWRENCE E. HICKS, Columbus, Ohio. (Read by title.)

10a. In memoriam: George Bird Grinnell. By ALBERT K. FISHER, Washington, D. C. (Read by title.)

TUESDAY AFTERNOON

Symposium: Subject—"The Problem of the Individual *vs.* the Species in Bird Study." Introduction by HERBERT FRIEDMANN, U. S. National Museum, Washington, D. C.

11. The individual *vs.* the species in behavior studies. FRANCIS H. HERRICK, Cleveland, Ohio.
12. *The intraspecific behavior of individuals (dominance). G. K. NOBLE, American Museum of Natural History, New York City.
13. The social Kumpan and the Song Sparrow. MRS. MARGARET M. NICE, Chicago, Illinois.
14. The individual *vs.* the species in migration studies. FREDERICK C. LINCOLN, U. S. Biological Survey, Washington, D. C.
15. *On the sociology of the Herring Gull (*Larus a. argentatus*). N. TINBERGEN, Leyden, The Netherlands.

WEDNESDAY MORNING

16. Native Quail on the Ligon Game Farm at Carlsbad, New Mexico. VERNON BAILEY, Washington, D. C.
17. Further notes on early American ornithology. ELSA G. ALLEN, Ithaca, New York.
18. Nesting habits ("injury-feigning") of Wilson's Snipe and Spotted Sandpiper. HENRY MOUSLEY, Montreal, Canada.
19. *Studies in the life history of the Wood Thrush (*Hylocichla mustelina*). FLORENCE WEAVER, Hanover, New Hampshire.
20. *Food habits of the Ivory-billed Woodpecker. JAMES T. TANNER, Cortland, New York.

21. *Food of the Starling in central New York State. ALTON A. LINDSEY, American University, Washington, D. C.
22. *Some interesting Barred Owls. W. BRYANT TYRRELL, Takoma Park, Maryland.
23. *The Flamingos of Great Inagua. GILBERT C. KLINGLE, Takoma Park, Maryland. (Read by title.)
24. Great Horned Owl orphans. ELIZABETH A. OEHLENSCHLAEGER, Milwaukee, Wisc. (Read by title.)
25. Birds of the District of Columbia. PAUL BARTSCH, U. S. National Museum, Washington, D. C. (Read by title.)

WEDNESDAY MORNING

26. A Pleistocene egg from Nevada. ALEXANDER WETMORE, U. S. National Museum, Washington, D. C.
27. An unusual structural modification of the feather. JOHN T. ZIMMER, American Museum of Natural History, New York City.
28. Observations on the auditory response of Starlings. ALBERT R. BRAND, and PAUL KELLOGG, Cornell University, Ithaca, New York.
29. Remarks on *Heleodytes chiapensis*. PIERCE BRODKORB, Museum of Zoology, Ann Arbor, Michigan.
30. *Metabolism studies of the development of temperature regulation in birds. S. CHARLES KENDEIGH, Baldwin Bird Research Laboratory and University of Illinois, Champaign, Illinois.
31. *Analysis of some hybrid populations of Juncos. ALDEN H. MILLER, Museum of Vertebrate Zoology, Berkeley, California.
32. *Intermittent breeding of the Fulmar, with some general observations on non-breeding sea-birds. V. C. WYNNE-EDWARDS, McGill University, Montreal, Canada.
33. Reverse Migration. HARRISON F. LEWIS, National Parks Bureau, Ottawa, Canada.
34. *Weights and measurements of some Atlantic *Alcidae*. R. A. JOHNSON, Oneonta, New York.
35. *Factors influencing the Laughing Gull's recognition of its eggs. G. K. NOBLE and D. S. LEHRMAN, American Museum of Natural History, New York City.
36. *Why the neognathous palate? W. WEDGWOOD BOWEN, Dartmouth College Museum, Hanover, New Hampshire.

WEDNESDAY AFTERNOON

37. **Recent progress in color photography. ARTHUR A. ALLEN, Cornell University, Ithaca, New York.
38. **Birds of the Western Arctic. CHARLES E. GILLHAM, U. S. Biological Survey, Edwardsville, Illinois.
39. **The survival problem of the Florida Crane. ROBERT P. ALLEN, National Association of Audubon Societies, New York City.
40. **Color in Kittiwake Cove. CLEVELAND P. GRANT, Baker-Hunt Museum, Covington, Kentucky.
41. **First nest of Tufted Jay and other rare birds of Northwestern Mexico. ROBERT T. MOORE, California Institute of Technology, Pasadena, California.
42. **Gull and tern nesting at Sturgeon Bay, Wisconsin. A. TREVENNING HARRIS, Gary, Indiana. (Read by title.)

THURSDAY MORNING

Joint session of the American Ornithologists' Union with the Eastern, Northeastern and Inland Bird-banding Associations.

43. *Preliminary notes on the migration and homing of Herring Gulls. R. P. ALLEN and J. J. HICKEY, National Association of Audubon Societies, New York City.
44. Some early results of the disease study project. CARLTON M. HERMAN and C. BROOKE WORTH, New York Zoological Park, New York City.
45. The study of some banded Black Ducks. MILES D. PIRNIE, Kellogg Sanctuary, Augusta, Michigan.
46. Life history of the Piping Plover. LEROY WILCOX, Speonk, Long Island, New York.
47. *Bird destruction in Pan-America. T. GILBERT PEARSON, International Committee for Bird Preservation, New York City.
48. The history of one hundred nests of the Arctic Tern. OLIN S. PETTINGILL, JR., Carleton College, Northfield, Minnesota.
49. Formation of the pair in the Black-crowned Night Heron. ROBERT P. ALLEN, National Association of Audubon Societies, New York City.
50. The twilight flight of the Black Tern. MILTON B. TRAUTMAN, Museum of Zoology, Ann Arbor, Michigan.
51. *Some census notes on the breeding birds of a wooded slope. J. J. HICKEY, National Association of Audubon Societies, New York City.
52. *The northern distribution and status of the English Sparrow (*Passer domesticus*). RICHARD WEAVER, Dartmouth College, Hanover, N. H.
53. **The present status of the Roseate Spoonbill in the United States. ALEXANDER SPRUNT, JR., National Association of Audubon Societies, Charleston, South Carolina.

THURSDAY AFTERNOON

54. **The Carnegie Museum Belcher Island Expedition. ARTHUR C. TWOMEY, Carnegie Museum, Pittsburgh, Pennsylvania.
55. **Birds of the Buckeye State. KARL MASLOWSKI, Ohio Division of Conservation, Columbus, Ohio.
56. **Wavie Crees of James Bay. CLEVELAND P. GRANT, Baker-Hunt Museum, Covington, Kentucky.
57. **The birds of Kent Island. ALFRED O. GROSS, Bowdoin College, Brunswick, Maine.
58. **Adventures with birds. OLIN S. PETTINGILL, JR., Carleton College, Northfield, Minnesota.

Attendance.—With a registered attendance of 233 members (all classes), the thirteenth Washington Meeting (1938) slightly exceeded in size the twelfth meeting held in 1927 when 215 members were present. It was the second largest meeting in the history of the Union. The list of those present in 1938 included one Patron, 1 Fellow Emeritus, 32 Fellows, 1 Corresponding Fellow, 49 Members, 149 Associates, and 91 visitors, making a total of 324. This was the largest attendance of Fellows on record, exceeding by three the previous high of the Salem meeting in 1930. The number of Members was exceeded only by the meetings of 1933 and 1936, the number

of Associates only by the meetings of 1929 and 1933, and the number of visitors only by the 1935 meeting.

Thirty States and Provinces were represented in the attendance. Exclusive of visitors, the nine largest delegations were: District of Columbia, 57; New York, 35; Pennsylvania, 20; Virginia, 14; Ontario, 13; Massachusetts, 12; Maryland, 11; Michigan, 10; and California, 8. Few meetings have had so many attending from a distance, and no other eastern meeting has had so many representatives from California. A third country was represented by Dr. N. Tinbergen of the University of Leyden, Netherlands.

ALBERTA, 1—*Associate*, A. C. Twomey, Camrose.

CALIFORNIA, 8—*Fellows*, L. B. Bishop, Pasadena; L. H. Miller, Los Angeles; *Members*, W. L. Chambers, Los Angeles; L. M. Huey, San Diego; A. H. Miller, Berkeley; James Moffitt, San Francisco; R. T. Moore, Pasadena; George Willett, Los Angeles.

CONNECTICUT, 2—*Member*, A. A. Saunders, Fairfield; *Associate*, F. P. Mathews, Southport.

FLORIDA, 1—*Associate*, Robert C. McClanahan, Pensacola.

GEORGIA, 2—*Fellow*, Herbert L. Stoddard, Thomasville; *Associate*, E. E. Murphey, Augusta.

ILLINOIS, 8—*Patron*, Mrs. Ruthven Deane, Winnetka; *Fellow*, Mrs. M. M. Nice, Chicago; *Members*, W. R. Boulton, Chicago; S. C. Kendeigh, Champaign; *Associates*, Frank Cassel, Wheaton; D. E. Davis, Wilmette; C. E. Gilham, Edwardsville; Mrs. H. D. Smith, Lake Forest.

IOWA, 1—*Associate*, Robert W. Allen, Ossian.

KENTUCKY, 2—*Associates*, C. P. Grant, Covington; Burt L. Monroe, Louisville.

LOUISIANA, 1—*Associate*, George H. Lowery, Louisiana State University.

MAINE, 2—*Fellow*, A. O. Gross, Brunswick; *Associate*, Ralph S. Palmer, Brunswick.

MANITOBA, 1—*Associate*, Charles L. Broley, Winnipeg.

MARYLAND, 11—*Member*, A. B. Howell, Baltimore; *Associates*, Talbott Denmead, Baltimore; W. C. Henderson, Chevy Chase; C. M. Herman, Baltimore; I. N. Hoffman, Bethesda; Mrs. H. B. Humphrey, Cabin John; Frank C. Kirkwood, Phoenix; Robert Overing, Landover; Frank R. Smith, Laurel; Mrs. Chester Snow, Chevy Chase; W. B. Tyrrell, Catonsville.

MASSACHUSETTS, 12—*Fellows*, G. M. Allen, Cambridge; J. L. Peters, Harvard; *Members*, J. B. May, Cohasset; W. M. Tyler, Boston; *Associates*, C. W. Buchheister, Boston; L. B. Hyde, Ware; Miss Jessie E. Kloseman, Boston; Howard B. Miller, Turners Falls; Miss Florence M. Pease, Conway; George L. Perry, Somerville; Norman A. Preble, Wakefield; G. J. Wallace, Lenox.

MICHIGAN, 10—*Fellow*, J. Van Tyne, Ann Arbor; *Members*, W. P. Brodkorb, Ann Arbor; M. D. Pirnie, Augusta; *Associates*, Mrs. Edith K. Frey, Jackson; H. W. Hann, Ann Arbor; T. D. Hinshaw, Ann Arbor; Ralph E. Morrill, Ann Arbor; Nels T. Peterson, Battle Creek; A. E. Staebler, Ann Arbor; M. B. Trautman, Ann Arbor.

MINNESOTA, 2—*Fellow*, T. S. Roberts, Minneapolis; *Member*, O. S. Pettingill, Jr., Northfield.

NEW HAMPSHIRE, 2—*Member*, W. W. Bowen, Hanover; *Associate*, Richard Weaver, Hanover.

NEW JERSEY, 3—*Members*, Beecher S. Bowdish, Demarest; C. H. Rogers, Princeton; *Associate*, Alfred E. Eynon, Union.

NEW YORK, 36—*Fellows*, A. A. Allen, Ithaca; J. P. Chapin, New York; Ernst Mayr, New York; R. C. Murphy, New York; J. T. Zimmer, New York; *Members*, Verdi Burtch, Branchport; Mrs. W. W. Naumburg, New York; J. T. Nichols, New York; T. Gilbert Pearson, New York; R. T. Peterson, New York; James Savage, Buffalo, Dayton Stoner, Albany; William Vogt, New York; *Associates*, Mrs. A. A. Allen, Ithaca; Dean Amadon, New York; H. H. Axtell, Cortland; Hugh Birckhead, Pelham Manor; A. D. Cruickshank, New York; S. C. Harriot, New York; J. J. Hickey, New York; J. C. Howell, Ithaca; R. A. Johnson, Oneonta; Paul Kellogg, Cortland; R. H. LeFevre, Buffalo; D. S. Lehrman, New York; C. W. Leister, New York; H. D. Mitchell, Buffalo; Mrs. Grace E. B. Murphy, Bronxville; W. W. Naumburg, New York; G. S. Raynor, Manorville; A. R. Shadle, Buffalo; J. T. Tanner, Cortland; Carll Tucker, Mt. Kisco; Mrs. Carll Tucker, Mt. Kisco; L. L. Walsh, Bronxville; LeRoy Wilcox, Speonk.

OHIO, 8—*Fellow*, Francis H. Herrick, Cleveland; *Member*, Lawrence E. Hicks, Columbus; *Associates*, H. W. Brandt, Cleveland; G. M. Cook, Youngstown; W. C. Herman, Cincinnati; Karl Maslowski, Cincinnati; C. F. Walker, Columbus; J. P. Visscher, Cleveland.

ONTARIO, 13—*Fellows*, J. H. Fleming, Toronto; Hoyes Lloyd, Ottawa; W. E. Saunders, London; P. A. Taverner, Ottawa; *Members*, J. L. Baillie, Toronto; H. F. Lewis, Ottawa; L. L. Snyder, Toronto; *Associates*, O. E. Devitt, Toronto; F. H. Emery, Toronto; Mrs. Wilmot Lloyd, Ottawa; E. G. McDougall, Toronto; Mrs. W. G. Mills, Toronto; C. E. G. Molony, Toronto.

PENNSYLVANIA, 20—*Fellows*, Witmer Stone, Philadelphia; W. E. C. Todd, Pittsburgh; *Members*, B. H. Christy, Sewickley; Francis Harper, Swarthmore; Wharton Huber, Philadelphia; J. F. Street, Philadelphia; *Associates*, L. J. Bennett, State College; Mrs. F. H. Coffin, Scranton; V. A. Debes, Prospect Park; George J. Free, State College; R. W. Glenn, Pittsburgh; Horace Groskin, Ardmore; L. A. Luttringer, Harrisburg; N. J. McDonald, Philadelphia; Miss Ruth Trimble, Greensburg; H. T. Underdown, Elkins Park; E. S. Weyl, Philadelphia; L. R. Wolfe, Philadelphia; H. B. Wood, Harrisburg; C. B. Worth, Swarthmore.

QUEBEC, 4—*Member*, V. C. Wynne-Edwards, Montreal; *Associates*, J. D. Cleghorn, Montreal; J. A. Decarie, Montreal; Mrs. Harold Hibbert, Montreal.

RHODE ISLAND, 1—*Associate*, H. E. Walter, Providence.

SOUTH CAROLINA, 2—*Member*, Alexander Sprunt, Jr., Charleston; *Associate*, Mrs. M. D. Dise, Charleston.

TENNESSEE, 2—*Associates*, Mrs. F. C. Laskey, Nashville; B. P. Tyler, Johnson City.

VERMONT, 2—*Member*, W. P. Smith, Wells River; *Associate*, Miss Carolyn Sheldon, Woodstock.

VIRGINIA, 14—*Member*, J. J. Murray, Lexington; *Associates*, J. B. Calhoun, University; J. C. Dickenson, University; T. L. Engleby, Roanoke; E. N. Grinnell, Arlington; C. O. Handley, Blacksburg; J. S. Y. Hoyt, Lexington; H. N. Kennedy, Rosslyn; John B. Lewis, Amelia; M. G. Lewis, Salem; W. B. McIlwaine, Alexandria; Mrs. R. M. Reese, Alexandria; Miss Ruth Richards, Clifton Station; O. B. Taylor, Richmond.

WASHINGTON, D. C., 57—*Fellow Emeritus*, Leonhard Stejneger; *Fellows*, Mrs. Florence M. Bailey, A. K. Fisher, Herbert Friedmann, Ira N. Gabrielson, A. H. Howell, F. C. Lincoln, W. L. McAtee, H. C. Oberholser, T. S. Palmer, E. A. Preble, J. H. Riley, Alexander Wetmore; *Members*, Vernon Bailey, Paul Bartsch,

Frank Bond, Harold C. Bryant, Miss May Thacher Cooke, Clarence Cottam, Herbert Deignan, E. A. Goldman, E. G. Holt, F. M. Uhler, R. W. Williams; *Associates*, C. H. M. Barrett, W. B. Bell, S. F. Blake, V. H. Cahalane, W. H. Cheesman, E. J. Court, Malcolm Davis, Mrs. Jane S. Elliott, H. C. Fuller, R. B. Horsfall, Neil Hotchkiss, H. H. T. Jackson, John C. Jones, Miss Phoebe M. Knappen, W. F. Kubichek, A. A. Lindsey, R. F. Mason, F. H. May, A. L. Nelson, Miss Mary O'Brien, P. H. Oehser, Mrs. T. S. Palmer, H. S. Peters, C. C. Presnall, W. W. Rubey, John C. Salyer, R. N. Saxton, C. F. Smith, H. M. Smith, H. B. Stabler, J. S. Wade, E. P. Walker, Howard Zahniser.

WEST VIRGINIA, 1—*Associate*, Karl W. Haller, Short Creek.

WISCONSIN, 1—*Associate*, Miss Elizabeth A. Oehlenschlaeger, Milwaukee.

NETHERLANDS, 1—*Corresponding Fellow*, N. Tinbergen, Leyden, Netherlands.

ELECTION OF OFFICERS

The election of officers for 1939 resulted as follows: President, Herbert Friedmann; Vice-Presidents, J. P. Chapin and J. L. Peters; Secretary, Lawrence E. Hicks; Treasurer, W. Rudyerd Boulton; Members of the Council (in addition to officers and ex-presidents), for three years, W. L. McAtee, John T. Zimmer and Robert T. Moore.

The Council elected Glover M. Allen, Editor of 'The Auk'; W. Rudyerd Boulton, Business Manager; George H. Stuart, 3d, C. H. Riker and Edward Norris, Trustees; and Herbert Friedmann, S. S. Gregory, Jr., W. Rudyerd Boulton, W. L. McAtee, and Lawrence E. Hicks, members of the Finance Committee.

ELECTION OF FELLOWS, MEMBERS AND ASSOCIATES

FELLOW—1.

Ira N. Gabrielson, Washington, D. C.

HONORARY FELLOWS—2.

Jacques Berlioz, Paris, France.
Henry Eliot Howard, Clarelands, Worcestershire, England.

CORRESPONDING FELLOWS—6.

K. A. Hindwood, Sydney, Australia.
Konrad Lorenz, Altenberg, Austria.
Wilhelm Meise, Dresden, Germany.
R. E. Moreau, Tanganyika, Africa.
Ernst Schuz, Ostpreussen, Germany.
N. Tinbergen, Leyden, Netherlands.

MEMBERS—8.

Herbert Girton Deignan, Washington, D. C.
Shepard Gilbert Emilio, Salem, Massachusetts.
Thomas Tonkin McCabe, Berkeley, California.
Harold Michener, Pasadena, California.
Gayle Benjamin Pickwell, San José, California.
Austin Loomer Rand, New York City.
Alexander Frank Skutch, Baltimore, Maryland.
Eustace Lowell Sumner, Jr., San Francisco, California.

ASSOCIATES—338.

The names of Associates who have qualified will appear in the membership list in 'The Auk' for April, 1939.

DECEASED MEMBERS

During the year the Union lost at least 24 members by death: 1 Fellow, 4 Honorary Fellows, 5 Corresponding Fellows, 3 Members, and 11 Associates.

GEORGE BIRD GRINNELL, Fellow (1883), aged 88, died at New York City, on April 11, 1938.

SERGIUS ALEXANDROVICH BUTURLIN,[1] Honorary Fellow (1907–16), died at Moscow, U. S. S. R., on January 22, 1938.

WILLIAM EAGLE CLARKE,[2] Honorary Fellow (1889–1921), aged 85, died at Edinburgh, Scotland, on May 12, 1938.

HENRI AUGUSTE MENEGAUX, Honorary Fellow (1916–18), died at Paris, France, on July 15, 1937.

LIONEL WALTER LORD ROTHSCHILD,[3] Honorary Fellow (1913), aged 69, died at Tring, England, on August 27, 1937.

ALBERT COLLIN, Corresponding Fellow (1928–31), died at Hovinmaa, Finland (date unknown, 1937 or earlier)

NATHANIEL GIST GEE, Corresponding Fellow (1919), Greenwood, South Carolina, died December 18, 1937.

FRIEDRICH STEINBACHER, Corresponding Fellow (1934), died at Berlin-Friedrichshagen, Germany, on February 15, 1938.

CHARLES FRANCIS MASSY SWYNNERTON, Corresponding Fellow (1918), died in Tanganyika Territory, East Africa, in January (?), 1938.

JOHANNES THIENEMANN,[4] Corresponding Fellow (1926), aged 75, died at Rossitten, Germany, on April 13, 1938.

WILLIAM ISAAC LYON, Life Member (1921–25), died at Waukegan, Illinois, on June 13, 1938.

FRANK STEPHENS,[5] Member (1883–1901), aged 88, died at San Diego, California, on October 5, 1937.

CHARLES ANDERSON URNER, Member (1920–33), aged 56, died at Elizabeth, New Jersey, on June 22, 1938.

BENJAMIN ADAMS, Associate (1911), died at Wethersfield, Connecticut, in 1938 (date?)

JAMES J. CARROLL,[6] Life Associate (1926), aged 62, died at Houston, Texas, on February 17, 1938.

JACK MURCHIE DUDLEY, Associate (1931), died at Calais, Maine, on September 13, 1938.

JAMES CHASE HAMBLETON, Associate (1935), aged 75, died at Columbus, Ohio, on July 6, 1938.

EDWIN CLARK KENT, Associate (1907), died at New York City, on July 11, 1938.

NATHANIEL THAYER KIDDER,[7] Life Associate (1906), died at Boston, Massachusetts, on July 13, 1938.

FERDINAND SCHUYLER MATHEWS, Associate (1917), aged 84, died at Plymouth, New Hamshire, on August 20, 1938.

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[1] For obituary notice, see Auk, vol. 55: 585, 1938.
[2] " " " " " " 55: 585, 1938.
[3] " " " " " " 55: 162, 1938.
[4] " " " " " " 55: 585, 1938.
[5] " " " " " " 55: 313–314, 1938.
[6] " " " " " " 55: 314–315, 1938.
[7] " " " " " " 55: 700, 1938.

NORMAN MCCLINTOCK,[1] Associate (1900), aged 69, died at Orlando, Florida, on February 26, 1938.

PUTNAM BURTON PEABODY, Associate (1903), died at Topeka, Kansas, on October 8, 1937.

JOHN LIVZEY RIDGWAY, Associate (1890), died at Glendale, California, in July, 1938.

WILL EDWIN SNYDER,[2] Honorary Life Associate (1895), aged 64, died at Beaver Dam, Wisconsin, on November 10, 1937.

MAY ROGERS (MRS. LAURENCE J.) WEBSTER,[3] Associate (1936), died at Boston, Massachusetts, on January 7, 1938.

GEORGE WHITNEY WHITE, Associate (1924), died at Washington, D. C., on October 27, 1938.

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[1] For obituary notice, see Auk, vol. 55: 585, 1938.
[2] " " " " " " 55: 700, 1938.
[3] " " " " " " 55: 314, 1938.

Annual Report of the Treasurer

The American Ornithologists' Union in account with W. L. McAtee, Treasurer, for the period November 1, 1937, to September 30, 1938, inclusive (11 months):—

Receipts

Balance, October 31, 1937		$1,237.54
Receipts for the fiscal year:		
Dues	$3,369.55	
Subscriptions	638.09	
Sales of publications	490.03	
Remittance from the Investing Trustees	2,600.93	
Life Membership fees	50.00	
Contributions	351.00	
Miscellaneous	19.50	
Total receipts for the fiscal year		7,519.10
Grand total of receipts including balance from previous year		$8,756.64

Disbursements

Manufacture of 'The Auk' and reprints thereof	$5,006.19	
Expenses connected with handling the reserve stock of publications	71.55	
Honorarium of the Editor	600.00	
Honorarium and expenses of the Secretary (two individuals involved. The honorarium and part of the expenses were for the previous Secretary, Dr. Palmer, and $32.15 for the present incumbent)	413.55	
Expenses of the Treasurer and Business Manager, including clerical assistance	929.62	
Contribution to the Zoological Society of London in support of the 'Zoological Record'	25.00	
Contribution to the expenses of the Charleston meeting	150.00	
Honorarium and cost of medal of the Brewster Memorial award	697.32	
Transfer of Life Membership fees to Investing Trustees	350.00	
Miscellaneous disbursements including audit of accounts for the previous year	86.61	
Total disbursements by the Treasurer		$8,329.84
Charges by bank for unpaid checks		10.00
Grand total of disbursements		$8.339.84

Recapitulation

Total receipts	$8,756.64
Total disbursements	8,339.84
Balance, September 30, 1938	$ 416.80

NOTICE OF MEETINGS

THE FIFTY-SEVENTH ANNUAL MEETING OF THE AMERICAN ORNITHOLOGISTS' UNION will be held in California in 1939. The customary fall date for the meeting has been abandoned in favor of the period of June 19 to 23. This is done to facilitate travel of eastern members to the Pacific Coast and to assure to those unacquainted with the western avifauna the opportunity of observing California species during the height of their spring activity. Hotel headquarters will be in Berkeley at the Durant Hotel, which is convenient to the University of California where many of the sessions will be held. Some of the sessions are planned for San Francisco, under the auspices of the California Academy of Sciences. Berkeley is now conveniently linked with San Francisco by the spectacular new Bay Bridge. This bridge also gives access to the San Francisco World's Fair of 1939 on Treasure Island. The Local Committee especially invites members of the Union to begin laying plans to attend the California meeting next summer. It is our hope that we may be of service in supplying information that will enable ornithologists to arrange an enjoyable summer vacation in the West, centering about the meetings.—ALDEN H. MILLER, *Chairman, Committee on Arrangements.*

THE FOURTH NORTH AMERICAN WILDLIFE CONFERENCE will be held during the week of February 13, 1939, at the Hotel Statler, in Detroit, Michigan. Wildlife restoration will again be the keynote, and the panel type of discussion that was, last year, so productive—and provocative—will once more be followed in general meetings. This conference annually attracts many of the foremost men in the conservation field, and A. O. U. members who may be able to attend will find the sessions both pleasurable and interesting. Further information may be secured from the American Wildlife Institute, Investment Building, Washington, D. C.—W. VOGT.

THE AUK

A Quarterly Journal of Ornithology

ORGAN OF THE AMERICAN ORNITHOLOGISTS' UNION

Edited by Dr. Glover M. Allen

MUSEUM OF COMPARATIVE ZOOLOGY

CAMBRIDGE, MASS.

To whom all articles and communications intended for publication and all books and publications for review should be sent.

Manuscripts should be typewritten if possible. As an aid in bibliography, titles should be brief. References to literature, if few, may be inserted in parenthesis at the appropriate places in the text, or listed at the end of the paper rather than in footnotes. Roman numerals and extensive tables are to be avoided. Line drawings intended for text illustrations should be in India ink; half-tones cannot be printed in the text since the paper is unsuitable. Longer articles should have a brief summary at the end. Except on request, no proofs of 'General Notes' or short communications will be submitted to authors.

Twenty-five copies of leading articles are furnished to authors free of charge. Additional copies or reprints from 'General Notes,' 'Correspondence,' etc., must be ordered from the editor when the manuscript is submitted.

THE OFFICE OF PUBLICATION

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BACK NUMBERS OF 'THE AUK'

THE edition of several recent numbers of 'The Auk' is now exhausted. For this reason members who do not care to keep their copies will confer a favor by sending any numbers they can spare of the volumes for 1936 or 1937, to MR. W. RUDYERD BOULTON, *Treas.*, Field Museum of Natural History, Chicago, Illinois.

By arrangement with the Service Department of the National Association of Audubon Societies, 1775 Broadway, New York City, inexpensive binders may be obtained for volumes of 'The Auk' or of 'Bird-Lore' by applying to the Department, which will furnish prices.

HOW TO AFFILIATE WITH THE AMERICAN ORNITHOLOGISTS' UNION

THERE are several classes of membership in the A. O. U., of which those of Associate or Life Associate are open to new affiliates. Associate Members receive 'The Auk' for a payment of $3 per year, one dollar less than the rate to non-affiliated subscribers. There is no initiation fee. Life privileges in the Associate class may be obtained for a single payment of $50. Associate Members (like all other classes) are elected only at the annual meeting of the Union, usually held in autumn, but applicants may be given the provisional status of associate member-elect and receive the volume of 'The Auk' for the year in which application is made, at the $3 rate. 'The Auk' is published quarterly, in January, April, July, and October.

Application for associate membership in the Union may be sent to

W. RUDYERD BOULTON, *Treas.*,
Field Museum of Natural History,
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